

**Ombudsman Report of  
Findings and Recommendations  
Regarding the  
Stauffer Chemical Company Site  
Tarpon Springs, Florida**

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Atlanta, GA  
December 29, 2000**

Letter to Dr. Falk

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# Acknowledgments

Gathering and compiling information for this report was a time-consuming exercise. Without the help of a number of individuals and groups, the task would have gone from daunting to impossible. I would like to acknowledge the following individuals for their role in developing this report:

- Congressman Michael Bilirakis and his staff, who coordinated hearings, the distribution of information, and a site tour
- Carl Blair, Agency for Toxic Substances and Disease Registry (ATSDR) Regional Representative, who traveled and attended many meetings with me
- Pascale Krumm, Ph.D., who worked tirelessly to edit the report
- The Visual Information Center of ATSDR, who assisted with layout and printing
- Debra Gable, ATSDR technical project officer, who served as liaison between the ombudsman, the Division of Health Consultation, and the Florida Department of Health (FDOH)
- Randy Merchant, FDOH, who gathered volumes of information from files, even during a move of his office
- The Management Analysis and Services Office (MASO) at the Centers for Disease Control and Prevention
- The Superfund Site Assessment Branch and the Spatial Analysis and Information Dissemination Section of the Division of Health Assessment and Consultation, ATSDR

In addition, the following individuals or groups from outside the federal and state government worked diligently to provide materials for the report:

- Jessie Burke
- Bruce Dickey
- Environmental Protection Agency (EPA) Regions IV and X
- Former employees of Victor/Stauffer
- Carlene Hobbs

- Bob Martin and Hugh Kaufman of the EPA Hazardous Waste Ombudsman's Office
- Mary Mosley
- Pinellas County Health Department Air and Water staff members
- Pi-Pa Tag, Inc., and its officers
- Stauffer Management Company
- The City of Tarpon Springs

Many others helped in the process and their assistance is recognized and greatly appreciated.

# ATSDR Ombudsman Program

## *What is the Role of the ATSDR Ombudsman?*

The ombudsman is an impartial public official who investigates complaints about the actions of government officials or administrative actions, and who seeks to solve problems, where warranted. The ombudsman lacks legal authority to reverse or modify program decisions of actions, either those already taken or those that may be taken in the future. However, on the basis of sound information gained through contact with the public, and the Agency for Toxic Substances and Disease Registry (ATSDR) staff, the ombudsman may, occasionally, effect program adjustments in resolving particular problems.

“The Ombudsman: A Primer for Federal Agencies” brochure defines the ombudsman as “client-centered but anti-bureaucratic, and rather than being a client advocate, the ombudsman is nonpartisan and impartial as an investigator.” ATSDR has elected to employ this **neutral**, third party concept as a basis for the ombudsman program.

ATSDR felt the need to establish a system to help the agency address public concerns more efficiently and to provide a forum for appraising states, local governments, tribes, community groups, and other federal agencies on public health issues. Thus, the ombudsman has been granted the independent authority to cut across bureaucratic lines to get answers, settle complaints quickly, and provide ready access to information.

Before the creation of the ombudsman position, ATSDR did not have a single representative whose essential purpose was to assist the public in resolving public health problems arising under the hazardous waste program. The ombudsman program can assist those—citizens and members of state and local governments, tribes, other federal agencies, the regulated community—who have been unable to voice a complaint or get their public health problem resolved through normal channels. To remedy problems, the ombudsman obtains facts, sorts information, and substantiates policy.

Many citizens and community members do not know how to gather information, or they get frustrated when trying to cope with the complexities of the hazardous waste program. The ombudsman program can help them with any problems they may have concerning ATSDR missions relating to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) and the Resource Conservation and Recovery Act (RCRA).

### ***What Skills Must an Ombudsman Possess?***

To be an effective facilitator among stakeholders and promote resolution of health-related issues, an ombudsman must possess a variety of people skills. An ombudsman must be able to promote constructive dialogue among groups with differing interests and opinions, and sometimes among hostile parties. An ombudsman must also have the ability to develop, evaluate, and successfully propose alternative solutions to issues. Additional skills required may include facilitation, mediation, negotiation, and fact-finding.

The ombudsman seeks to gain the trust of citizens, state or local governments, regulated communities, tribes, and the staffs of ATSDR and other federal agencies. To be effective, the ombudsman must be impartial and able to assess complaints in a fair and responsible manner. The ombudsman must also work within the agency's system to address problems.

### ***What Is the Role of the Ombudsman in Conflict Situations?***

Occasionally, the ombudsman is involved in conflict situations. Conflict results from incompatible goals and differing values. However, such differences are frequently perceived rather than real. If the parties can find **common ground**, they may realize that resolving the issue is in their mutual best interest, and thus begin the problem-solving process. However, if an agreement cannot be reached, the ombudsman conducts an investigation and prepares an *Ombudsman Report of Findings and Recommendations*, which is submitted to the assistant administrator.

The most important method of accomplishing resolution is to depersonalize the situation. For example, situations may be described so that no party is threatened or judged negatively. Whenever possible, the ombudsman should negotiate to find acceptable solutions and also involve the public. An effective ombudsman brings people together by acting as a mediator.

### ***What Are the Limitations of the Ombudsman?***

**The ombudsman cannot be an advocate for any party, including ATSDR**, neither should the ombudsman be a substitute for the normal process. The ombudsman should not be considered another forum for questioning or challenging agency policy. The ombudsman must function, not as a substitute, but as a supplement to existing institutions in the assessment of public health and health risks relating to hazardous waste. ATSDR staff and the ombudsman share a common goal to ensure that, during actions relating to hazardous materials, the public health is protected and the agency is responsive to public participation in its actions.

### ***What Criteria does the Ombudsman Follow?***

An effective ombudsman seeks to follow these criteria:

- Focus on the issue, not the person(s)
- Try to define issues in terms of public health results
- Do not place persons in a win-lose situation
- Promote discussions that enhance the building of relationships rather than conflicts

### ***In Summary***

The ombudsman is a government resource to help resolve disputes that persist in spite of efforts to deal with the issues at an operational level. The ombudsman is an objective facilitator who helps ATSDR and its customers reach mutually acceptable solutions to public health issues. A part of the ombudsman's effort includes working with federal, state, or local agencies to gather complete information to consider in the public health problem-solving process.



## Executive Summary

As a result of a year-long investigation, the Agency for Toxic Substances and Disease Registry (ATSDR) ombudsman has issued the first *Ombudsman Report of Findings and Recommendations Regarding the Stauffer Chemical Company Site in Tarpon Springs, Florida*.

Members of the community surrounding the Stauffer Chemical Company hazardous waste site in Tarpon Springs, Florida, felt that the materials assessing the health in the community were incomplete, insufficient, and inaccurate. The ombudsman was asked to consider the matter and determine whether the documents were complete and whether quality science was used in the development of the materials.

Following is a list of the major findings cited in the ombudsman report.

- The 1993 preliminary public health assessment (PHA) was produced without gathering and considering all the available relevant data, and was based on background samples taken from an area too close to the site. The PHA made no attempt to determine past impact on the present and future health of the community. Since the PHA was prepared, volumes of new data have been produced and are available for consideration.
- Air emissions from the plant were plentiful and had a negative impact on life in the community, from the time the plant first opened in 1947 and for many decades. In the 1970s, efforts were made to control the emissions, yet air standards continued to be violated repeatedly.
- Some materials used in the public health education project contained errors and inaccurate statements. No education materials were prepared in Greek, the native language of a large segment of the local population.

- Massive amounts of raw fibrous asbestos were used in the operation of the plant. However, the materials have not been accounted for and may have impacted the health of the community.
- Children who attended Gulfside elementary school were potentially exposed to air emissions from the plant.
- The health of former plant workers was likely impacted. The Occupational Safety and Health Administration (OSHA) and the National Institute for Occupational Safety and Health (NIOSH) should assess the health of these workers. No assessment of the health impact has been made.
- Private wells in the area of the site are far more prevalent than previously thought. An accurate survey has not been conducted to determine the exact number of wells in use. Additional testing of the wells are required to determine health impact.
- The public perceives issues of off-site slag contamination in Tarpon Springs as having been handled inconsistently with similar contamination at similar sites.

Following are the major recommendations from the ombudsman.

- ATSDR should prepare a new peer reviewed PHA or other appropriate public health material. The document should consider all the new data available, materials not previously considered, and reconsideration of materials used to develop health consultations and assessments.
- A new public health education project should be developed and implemented in the Tarpon Springs area, including materials written in Greek.



- A study should be conducted on a cohort of former students of the Gulfside elementary school to determine the impact of air emissions from the plant on their health.
- Additional tests should be conducted on slag in the on-site and off-site slag areas to determine whether the slag contains asbestos fibers and whether the fibers are being released into the air. ATSDR decisions regarding slag should be consistent. Consideration should be given to the use of the *Graded Decision Guidelines* regarding off-site slag contamination.
- Following the confirmation of groundwater flow, tests should be conducted on an ample number of private wells to ascertain the water quality and related health impact on users of the water. The testing protocol should consider the short half-life of some contaminants and ensure that analysis is conducted.
- OSHA or NIOSH should assess the health of former workers. If these agencies fail to take action, ATSDR should consider developing an appropriate health response.
- As provided for in 42 U.S.C Section 9604(d)(1), a new procedure should be developed for the distribution of funds to state partners for health activities. The new procedure would provide ATSDR access to documents and materials gathered by the state partner and should address ownership of the records. The new procedure may be a revised program announcement or the employment of contracts rather than cooperative agreements.
- Pursuant to 42 U.S.C Section 9604(d)(2), the ATSDR assistant administrator should work with the State of Florida to determine how much of the cost associated with the new public health assessment should be repaid by the state. The public should be informed of the determination.

- ATSDR should employ civil investigators to assist health assessors in gathering materials for health assessments and health consultations.
- ATSDR should work with the Environmental Protection Agency to determine whether “yellow cake” (processed uranium) was produced at the site. Both agencies should also determine the purpose and impact of any military or para-military maneuvers conducted at the site in the 1990s.

# **Chapter 1: Request for Ombudsman Participation**

## **Two Citizens Request Ombudsman's Involvement**

In early October 1999, two Tarpon Springs, Florida, citizens sent materials to the Agency for Toxic Substances and Disease Registry (ATSDR) ombudsman with a request that the materials be forwarded directly to Dr. Henry Falk, assistant administrator of ATSDR. The materials, dealing with the Stauffer Chemical Company site (the site), were supportive of the citizens' personal and, to a large extent, the community's feeling that past public health assessments (PHAs) and consultations regarding the site were incomplete and that recommendations contained in the documents had not been completed. The comments and supporting materials were also in response to an addendum to the 1993 PHA, specifically looking into off-site slag and possible resulting contamination. The materials were forwarded to the assistant administrator and returned to the ombudsman 2 weeks later.

One citizen was deeply concerned about the present and future health of children who attended Gulfside elementary school during the 4-year period (1977–81) when the school was open while Stauffer Chemical (Stauffer) was still operating. The other citizen was concerned about the health of former Stauffer workers. She had tried in vain to get the National Institute for Occupational Safety and Health (NIOSH) to study the health of the workers and offer medical monitoring as recommended in the 1993 PHA.

In the weeks following the submission of the documents, the ombudsman received numerous calls from the two citizens, each expressing serious concerns about past, present, and future impact of the site on the health of local residents. Both asked the ombudsman to consider becoming involved at the site.

## **Chronology of Events**

On December 2, 1999, the ATSDR ombudsman, Congressman Michael Bilirakis, the Environmental Protection Agency (EPA) Hazardous Waste ombudsman and his senior

investigator, officials from Stauffer, and citizens toured the site. While touring the site, Congressman Bilirakis expressed concerns regarding the federal response to the need for cleanup and the associated health issues. The ATSDR ombudsman also attended the EPA ombudsman hearing regarding the proposed cleanup of the site, where citizens raised many questions concerning the response of both EPA and ATSDR relative to the site.

On February 12, 2000, Pi-Pa-Tag, Inc., sent a 7-page letter, with 22 supporting documents, to the ombudsman, seeking formal involvement at the site (Pi-Pa-Tag is a not-for-profit citizens group, which received a technical assistance grant from EPA to employ non-governmental professionals in the review of technical materials related to the site).<sup>1</sup> In the letter, the group outlined a variety of problems with the site which, in their opinion, could still impact public health in the Pinellas/Pasco County area. The group also mentioned how ATSDR's effort regarding the site failed to meet statutory standards.

On February 12, 2000, the ATSDR ombudsman attended a second EPA ombudsman hearing and heard additional allegations that ATSDR should renew its review of the site and the resulting impact on community health, past, present, and future.

On April 18, 2000, Congressman Bilirakis formalized his request for the ATSDR ombudsman's participation, in addition to the participation of the EPA ombudsman.<sup>2</sup>

### **The Ombudsman Investigation**

After considering the requests and reviewing the materials provided by the citizens and Pi-Pa-Tag, the ombudsman examined the PHA and the health consultations, and concluded that ample questions were present to warrant involvement and announced acceptance of the request from the two citizens and Pi-Pa-Tag.

Ordinarily, the ombudsman tries to bring the parties together to facilitate a workable agreement. However, in the Stauffer matter, attendance at two EPA ombudsman hearings indicated that this

would be futile, so an investigation was started, which resulted in the present report. The investigation included the following:

- Attending three EPA ombudsman hearings and reading the transcripts,
- Touring the Stauffer site,
- Consulting local newspaper archives, court records, and the Federal Record Center in Atlanta,
- Interviewing local residents, former workers, and one physician,
- Visiting local health and environmental agencies,
- Reviewing well data from the City of Tarpon Springs, and Pinellas/Pasco Counties,
- Reviewing records from EPA's Regions IV and X, two ATSDR divisions, and Florida's Department of Health, and
- Reviewing materials from local citizens and the Stauffer Management Company.

## Chapter 2: Site Background

### Stauffer Plant Location

In February 1946, Victor Chemical Company purchased land in Pinellas County, Florida, near the Pasco County line, to build a facility to process phosphate from ores mined in the state.<sup>3</sup> The 160-acre site (130 acres are dry and 30 acres extend into the Anclote River and Meyers Cove) is located in Tarpon Springs, between Anclote Boulevard and the Anclote River, about 1 mile east of the Gulf of Mexico.<sup>4</sup> Exhibits 1–5 show the location of the site. The plant itself is located on the banks of the Anclote River and, in areas, is adjacent to the Tarpon Springs city limit along the northern shore of the river.<sup>5</sup>

By March 1947, foundations had been poured and some structural steel had been erected.<sup>6</sup> The plant, a \$3 million investment,<sup>7</sup> became operational on November 19, 1947, according to the *Tarpon Springs Leader*.<sup>8</sup> The facility had a 320-ton capacity kiln.<sup>9</sup> From late 1947 until 1981, elemental phosphorus was extracted at the plant.<sup>4</sup> By March 1948, the first claims of health impact and damage to plant life had been reported.<sup>6</sup>

### Plant Ownership History

Throughout its history, the plant changed ownership several times. Following is a chronology of those ownerships, as provided by Michael Kelly, Stauffer's attorney.<sup>10</sup>

- 1946-late 1950s: Victor Chemical Company operates the plant.
- 1960: Stauffer Chemical Company purchases the plant. Although the plant changes ownerships several times, Stauffer operates the site until its close in 1981.
- 1985-87: Chesebrough-Ponds purchases the plant.
- 1987: A subsidiary of Imperial Chemical Industries (ICI) American Holdings, Inc., purchases Stauffer Chemical Company.
- Late 1987: Stauffer Chemical Company is resold to Rhône-Poulenc, Inc.
- November 1987: Atkemix Thirty-Seven, Inc., (a subsidiary of Zeneca) purchases the plant.

**Exhibit 1. Map of Florida**

**Exhibit 2. Map of Tarpon Springs and Adjacent Zip Codes**



**Exhibit 3. Topographic Map of Stauffer Chemical Company and Vicinity**

**Exhibit 4. Aerial Photograph of Stauffer Chemical Company and Vicinity**

**Exhibit 5. Aerial Photograph (Closeup) of Stauffer Chemical Company**

Efforts to dismantle the plant began in 1986.<sup>11</sup> In 1987, as a result of a divestiture of the Stauffer Chemical Company, Stauffer Management Company was formed to manage the site and the cleanup.<sup>12</sup> According to Kelly,

Atkemix and Rhône-Poulenc Ag Company, Inc. are the Settling Defendants for the Consent Decree. Essentially, what we have is the current owner (Atkemix) and the former owner (Stauffer Chemical Company succeeded by Rhône-Poulenc Ag Company, Inc.) agreeing to do the cleanup of the Site.<sup>10</sup>

### **Plant Production**

The main plant site is south and west of Anclothe Road. This area originally included the phosphate ore processing and phosphorus production facilities, waste disposal facilities, lagoons and ponds, office and administration buildings, and several railroad spurs for receiving raw materials and shipping finished products. The area north of the site, between Anclothe Road and Anclothe Boulevard, contained production wells for process water and stored crushed slag and other waste materials. The railroad spurs and most buildings have been removed.<sup>13</sup>

### **The Gulfside Elementary School**

In the fall of 1977, the Gulfside elementary school opened on Anclothe Boulevard, across the plant site and slag crushing operation. The school enrolls approximately 700 children, from pre-kindergarten through grade five. The children are between 3 and 11 years old, 53% are male and 47% female. The student body is 91% white, 3% Hispanic, 2% black, 2% Asian, and 2% American Indian or other races.<sup>14</sup> Residential areas are located north of the site.<sup>11</sup> A hospital, a nursing home, and a children group home are located within 1 mile of the school.<sup>14</sup>

According to ATSDR's GATHER software, the 1990 census indicated that 9,283 persons lived in 4,939 housing units within 1 mile of the site. Of that population, 8,990 were white, 208 black, 207 Hispanic, 36 Asian or Pacific Islander, and 25 American Indian, Eskimo, or Aleut. There were 1,473 females between 15 and 44 years old, 553 children under the age of 6, and 2,958 persons over the age of 65 (Exhibit 6).

**Exhibit 6. GIS Maps and Demographic Statistics of Tarpon Springs**

## Detailed Site Characteristics

The February 2000 draft date evaluation report by Black and Veatch Special Projects Corporation for EPA Region IV, outlined the following detailed site characteristics:<sup>15</sup>

### Geology

Regional geologic information is outlined in the Southwest Florida Water Management District (SWFWMD) Northern Tampa Bay Water Resources Assessment Project. The Northern Tampa Bay area, which includes Pinellas County, Northwest Hillsborough County, and Southwest Pasco County, is underlain by a thick sequence of sedimentary strata that can be divided into an upper zone of unconsolidated sediments and a lower zone of consolidated carbonate rock.

At land surface, undifferentiated sediments comprised of silt, sand, and clay form surficial deposits, varying in thickness from less than 10 feet in coastal areas to over 100 feet in paleo-karst depressions or sand ridges. The typical thickness varies from 20 to 50 feet (SWFWMD, 1996).

Underlying the surficial sediments, the upper portion of the Arcadia Formation contains mostly siliciclastic clayey material that grade into a carbonate sequence. These sediments were formed largely as a result of Miocene terrestrial and marine depositional mechanisms. However, a significant portion of these clayey materials are residual products created during the Pliocene epoch as a result of physical and chemical weathering of the limestone surface (SWFWMD, 1996).

A 1987 hydrogeologic assessment conducted by Seaburn and Robertson concluded—based on boring information from four well cluster locations—that a continuous clay and silt layer is beneath the site (S&R, 1987).

The remedial subsurface investigation concluded that the surficial sands range in thickness from 7 to 36 feet across the site and that these sediments are underlain by a 0.25- to 6-foot thick unit of sandy clay to clay that overlies a weathered marl consisting of poorly sorted deposits of shells, sand, silt, and clay (Weston, 1993).

Throughout the Tampa Bay area the undifferentiated Arcadia formation is underlain by the Tampa member of the Arcadia formation. This unit is a white to light-gray, sandy, hard to soft, locally clayey, fossiliferous limestone that contains phosphate and chert in places. The phosphate content of the Tampa member is low in comparison to the remainder of the Hawthorn group. The Tampa member ranges from 0 to 200 feet in thickness throughout the Northern Tampa Bay area near the Stauffer site. The Tampa member is approximately 50 feet thick (SWFWMD, 1996).

## **Hydrogeology**

Two aquifers are located in the North Tampa Bay area, the surficial aquifer and the Upper Floridan aquifer. The surficial aquifer consists primarily of sand, while the Floridan aquifer is made up mostly of limestone. A thin semi-confining layer generally separates the two aquifers. Throughout Pinellas County this unit consists of silt and clay beds belonging to the upper, undifferentiated Arcadia formation of the Hawthorn group (SWFWMD, 1996).

The Floridan aquifer consists of the Upper Floridan aquifer (containing fresh water) and the Lower Floridan aquifer (with high chloride content water throughout much of southern Florida). Underlying the surficial sands and clays is a series of tertiary limestone and dolomite units that form the carbonate platform of peninsular Florida. The sequence of carbonate rocks comprising the Upper Floridan aquifer include, in descending order, the following members or formations:

- Tampa member of the Arcadia formation,
- Suwanee Limestone,
- Ocala Limestone, and
- Avon Park, Oldsmar, and Cedar Keys formations.

The Oldsmar and Cedar Keys formations can be considered the base of the freshwater production zone of the Upper Floridan aquifer. This entire carbonate sequence thickens and dips toward the southwest. The total thickness of the Upper Floridan aquifer marine sequence varies from 950 to 1,200 feet (SWFWMD, 1996).

## **Geophysics**

As part of the expanded site investigation activities at the site, NUS Corporation conducted two geophysical screenings. The first was conducted on May 5–6, 1987, to verify suspected drum locations and to attempt to detect potential contaminant plumes. A magnetometer was used to search for buried drums and other ferrous objects, while an electromagnetic (EM) non-contacting ground conductivity meter (EM-3 1 -D) was used to screen for possible contaminant plumes. The EM survey was unsuccessful because of the proximity of saline groundwater.

On March 29–30, 1993, EPA conducted an independent ground penetration radar survey of Ponds 48 and 50, as part of the pond material investigation. The objective of the survey was to locate drums that might be buried at the site.

Geophysical investigations performed at the site to date were performed primarily for the purposes of source characterization. Information gathered from these studies is not pertinent to the geology or hydrogeology of the site.

### **Surrounding Land Use**

The site is located northwest of Tarpon Springs, Florida, at the Pasco/Pinellas County line. The present land use in the surrounding area is mixed and includes light industrial, commercial, residential, and recreational areas. Additionally, there are undeveloped areas near the site (NVS, 1989).

The urbanized lands generally parallel the U.S. 19 corridor and include New Port Richey and Tarpon Springs. The urbanized portions are dominated by residential uses in the form of subdivision developments. Commercial uses have generally followed the residential development and are located along the major road corridors and intersections. Light and heavy industrial uses are located along the Anclote River, and include marina and ship repair facilities, an electric power generating plant, and auto salvage yards (NUS, 1989).

Several county parks and beaches are located near the site, including the Pasco County Beach on the north shore of the Anclote River about 3,500 feet west of the site, Fred Howard Park, and Sunset Beach Park. Additionally, two county recreational areas with beaches are located on the Gulf of Mexico less than 2 miles from the site, and the Pinellas County Anderson Park is located on Lake Tarpon about 3 miles east of the site (NUS, 1989).

A population increase throughout the Tampa Bay area has resulted in rising water demands. As a result, Tampa Bay Water has proposed the construction of a 25-million gallon desalination plant on the Anclote River, approximately 1 mile downstream of the site in 1999 (Times, 1999a). The desalination plant will probably be built in southern Hillsborough County (Times, 1999b).

Increasing demand from local industries or utilities could potentially affect groundwater flow in the Tarpon Springs area by inducing a cone of depression within the potentiometric surface of the Floridan aquifer. This risk is moderated by the potential for saltwater intrusion in coastal Pinellas County. In the Tarpon Springs area, the freshwater/saltwater transition zone is expected to occur at 50 to 100 feet below land surface. The proximity to the Gulf of Mexico, the Anclote River, and interconnections between these water bodies and the Floridan aquifer suggest that groundwater withdrawals are large enough to create a regional cone of depression.

### **Stauffer Placed on National Priorities List**

In 1974, a field investigation of the site was begun with on-site well sampling. In 1987, additional multi-media investigation projects were also initiated. In 1993, the Florida Department of Environmental Protection conducted a contamination assessment investigation in response to reported groundwater and soil contamination found near two former above-ground fuel oil



storage tanks which had been removed in 1992. In February 1992, the Stauffer site was proposed for inclusion on the National Priorities List (NPL). The proposal was published in the Federal Register.<sup>16</sup> In 1994, the site was placed on the NPL.

## Chapter 3: ATSDR Response

The Florida Department of Health (FDOH), under a cooperative agreement with ATSDR, developed most of the public health assessments, public health consultations, and other projects related to the Stauffer site. Following is a list of published documents.

- Preliminary public health assessment of the Stauffer site (FDOH, 8/1993)<sup>4</sup>
- Health consultation on the final site remedial investigation report (ATSDR, 1/1994)<sup>17</sup>
- Health consultation on air monitoring (FDOH, 12/1995)<sup>13</sup>
- Health consultation on the Gulfside elementary school (FDOH, 7/1998)<sup>14</sup>
- Analysis of cancer incidence patterns among former employees of Stauffer (FDOH, 4/1999)<sup>18</sup>
- Addendum to the public health assessment on the issues surrounding the off-site slag (ATSDR, 8/1999)<sup>19</sup>
- Health consultation on private wells in Tarpon Springs (FDOH, 8/1999)<sup>20</sup>

### **Preliminary Public Health Assessment of the Stauffer Site (FDOH, 8/1993)**

The assessment cited 1990 census data showing that 14,000 people live within a 1-mile radius of the site, and about 4,700 people live within 1 mile south of the river.<sup>4</sup>

The report cites the following conclusions, recommendations, and public health actions:

#### **Conclusions**

Based on the information currently available, this site is classified as a public health hazard. Specific reasons for this classification are as follows:

- Arsenic is present in surface soil, sediment, and both shallow and deep groundwater. On-site workers were exposed to arsenic in soil and dust when the plant was operational. Those currently working at the site are exposed to contaminants in soil, sediments, and dust.

- Arsenic, beryllium, cadmium, and chromium have been detected in on-site soil and sediment, on- and off-site groundwater and off-site surface water at levels above ATSDR comparison values. Each of these contaminants is a known or suspected lung carcinogen.
- Radium has been detected above background levels in on-site soil, sediment, and groundwater, and in off-site soil. No off-site groundwater or sediment samples have been analyzed for radium.
- Only two deep groundwater wells have been monitored on-site and there is insufficient information about off-site surface and subsurface soils to determine the potential for exposure from these sources.
- Arsenic, cadmium, chromium, fluoride, lead, thallium, and vanadium in shallow and/or deep on-site groundwater also appear in shallow and/or deep off-site groundwater. These contaminants may appear in the future in private wells south and west of the site.
- Arsenic is present in one off-site drinking water well and one private well currently used for irrigation. It is also present in off-site shallow and deep groundwater and in the nearby river. Arsenic concentrations have been detected above the corresponding EPA reference dose (RfD).
- Surface soil, groundwater, surface water, and sediment are considered to be completed exposure pathways for this site in the past, currently, and in the future. Ambient air is considered to be a completed exposure pathway in the past and could be in the future.

## **Recommendations**

### **Cease/Reduce Exposure Recommendations**

- The Occupational Safety and Health Administration (OSHA) and the National Institute for Occupational Safety and Health (NIOSH) should conduct medical monitoring on the workers at the site. Workers currently on the site should have appropriate protective equipment while working around contaminated soil/sediment.
- Future remediation workers should have appropriate protective equipment while on-site. During remediation work, adequate dust suppression measures should be used to prevent contaminated dust from reaching the community around the site. Air monitoring should be conducted during remediation to ensure that air-borne contamination is not transported off-site.

### **Site Characterization Recommendations**

- Characterize off-site shallow and deep groundwater for radium. Areas to sample should include private and monitoring wells.
- Characterize on-site deep groundwater, and off-site surface and subsurface soil for all contaminants of concern. Areas to sample should include the plant processing and slag storage areas, nearby residential property, and the elementary school.
- Monitor private wells within ½-mile south and west of the site to ensure that any future contamination is detected as soon as possible.

### **Public Education Recommendations**

- Area residents who obtain their drinking water from private wells should be informed of the possibility of current and future contamination.
- A health education program should be conducted to help community members and on-site workers understand their potential for exposure and possible health risks.

### **Health Activities Recommendation Panel (HARP) Recommendations**

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, requires ATSDR to perform public actions needed at hazardous waste sites. To determine if public health actions are needed, ATSDR's Health Activities Recommendation Panel (HARP) has evaluated the data and information developed in the Stauffer Chemical Co. (Tarpon Springs Plant) PHA.

The Panel has determined that the following actions are needed at this site:

- Local residents and on-site workers are being exposed to contaminants in private well drinking water and surface soil. Health education is needed to assist these groups in understanding their potential for exposure and possible health risks, and to inform them of measures they can take to reduce their exposure.
- Physicians and other health professionals treating members of the community near the site may not be aware of the potential exposures to their patients. Health professions education is needed to inform the local medical community about the health effects that may occur in individuals exposed to contaminants from the site.
- Available data about cancer rates in the area must be reviewed (health statistics review). The FDHRS [Florida Department of Health and Rehabilitative Services] completed the review in this public health assessment.

If information becomes available indicating additional exposures at levels of concern, ATSDR will evaluate that information to determine additional necessary actions.

### **Public Health Actions**

This section describes what ATSDR and/or FDHRS will do at the Stauffer Chemical Co. (Tarpon Springs Plant) site after the completion of this public health assessment report. The purpose of a public health action plan is to ensure that any existing health hazards are reduced and to prevent any future health hazards. ATSDR and/or FDHRS will accomplish the following:

- The Pinellas County Public Health Unit (PCPHU) will periodically monitor private wells near the site to detect increases in current contaminants or the appearance of new ones.
- FDHRS will develop educational materials to inform residents who may be consuming contaminated water from private wells of their potential for exposure and possible health risks. In particular, the material will discourage the use of this water for drinking, cooking or other domestic purposes.
- The PCPHU will assist FDHRS in distributing these educational materials to the affected residents and provide consultation to those individuals who require additional information or assistance.
- FDHRS will develop physician education materials to inform local physicians of the possibility that their patients may exhibit adverse health effects resulting from exposure to contaminants from the Stauffer site.
- ATSDR will assist FDHRS in developing these educational materials to ensure that the information is accurate and reflects the most recent scientific findings and agency guidelines.
- ATSDR in cooperation with FDHRS will notify NIOSH about the need for medical monitoring of the workers at this site.
- ATSDR and/or FDHRS will reevaluate the public health action plan when new environmental, toxicological, or health outcome data are available.

### **Health Consultation on the Final Site Remedial Investigation Report (ATSDR, 1/1994)**

On January 21, 1994, Kenneth Orloff, Ph.D., of ATSDR, issued this health consultation, stating that “No potable wells are located on-site or down gradient of the facility. However, the surficial aquifer is not being used as a potable water source in the area.”<sup>17</sup> The report provided the following conclusions and recommendation:

## **Conclusions**

Based on the information received, ATSDR concludes the following:

- Surface soil samples from the Gulfside Elementary School did not contain chemical or radionuclide contaminants at levels that would pose a public health hazard.
- Surface soil samples from the Stauffer Chemical site contained elevated concentrations of arsenic and radionuclide contaminants. The contaminant levels do not pose an imminent and substantial endangerment to human health. However, long-term exposure to the contamination could pose a public health threat.

## **Recommendation**

Continue to restrict access to on-site contamination until appropriate remedial actions have been implemented.

## **Health Consultation on Air Monitoring (FDOH, 12/1995)**

On December 20, 1995, the Florida Department of Health and Rehabilitative Services (FDHRS, now FDOH), issued this health consultation regarding sulfur dioxide emissions from the Stauffer plant.<sup>13</sup> The health consultation cites 1990 census data indicating that 14,000 individuals live within a 1-mile radius of the plant.<sup>13</sup>

Little air monitoring data is available for the Tarpon Springs area prior to 1977. After air monitoring stations were installed near the southeast corner of the plant, samples were collected by 24-hour bubblers and 3-hour continuous monitoring. Both measurements from 1977 through 1979 were exceedingly higher—by an order of 4 to 6 times—than the readings for 1980 and 1981, when the plant ceased operations.<sup>13</sup>

The report provided the following conclusion and recommendation:

## **Conclusion**

Based upon the information reviewed, we conclude that adverse health effects from exposure to sulfur dioxide from the Stauffer Chemical Company site between 1977 and 1981 are unlikely except in especially sensitive individuals. As noted above (in the discussions), we do not have sufficient information to evaluate the likely health effects from exposure to sulfur dioxide prior to the establishment of the air monitoring station in 1977. If additional information becomes available indicating exposure at levels of

concern, FDHRS will evaluate that information to determine what actions, if any, are necessary.

### **Recommendation**

FDHRS recommends that individuals, such as asthmatics, or anyone who may have become sensitive to the effects of sulfur dioxide avoid exposure in the future.

### **Health Consultation on the Gulfside Elementary School (FDOH, 7/1998)**

On July 22, 1998, FDOH's Bureau of Environmental Toxicology published this health consultation, citing 1990 census data, indicating that 3,200 persons lived within 1 mile of the school, which is across the road from the site. It also stated that "about 100 private wells are within the same area."<sup>14</sup>

The report considered soil and air sample data taken on a number of occasions, by different parties. The following samples were considered:

- April, 1989. An EPA contractor collected two soil samples at an undefined depth from the school grounds, which were analyzed for chromium, lead, and manganese.<sup>14</sup>
- July 21, 1993. Stauffer collected three surface soil samples from the Gulfside property, which were analyzed for metals, cyanide, fluoride, total phosphorus, radium-226, and polonium-210.<sup>14</sup>
- July 10 to August 11, 1997. Pasco County School Board contractors collected 10 air samples (four outside and 10 inside the building) and 21 surface soil samples, up to 3 inches deep. The air samples were analyzed for phosphorus, phosphorus pentoxide, phosphoric acid, and asbestos. The soil samples were analyzed for total phosphorus, phosphoric acid, and asbestos.<sup>14</sup>
- September 19, 1997. Pasco County School Board contractors collected three soil/aggregate (gravel) samples from beneath asphalt paving, two samples of asphalt

paving materials, and one sample of roofing aggregate from the school building. The samples were analyzed for various radiological properties, including polonium-210 and radium-226.<sup>14</sup>

The report considered pica children, those who consume dirt, and non-pica children, and provided the following conclusion and recommendation:

**Conclusion**

Based upon the information reviewed, we conclude that illnesses are unlikely in adults, pica children, and non-pica children from exposure to contaminants in soil, aggregate, and air in the Gulfside Elementary School. Completion of the playground for pre-kindergarten students will eliminate any exposure of these children to chemicals in the soil. If additional information becomes available concerning chemical exposures at Gulfside Elementary School, FDOH will evaluate that information to determine what actions, if any, are necessary.<sup>14</sup>

**Recommendation**

The Florida Department of Health recommends no further public health actions regarding the soil, aggregate, and air at the school.

**Analysis of Cancer Incidence Patterns among Former Employees of Stauffer Chemical (FDOH, 4/1999)**

In April 1999, FDOH's Bureau of Environmental Epidemiology published a study of former Stauffer workers and cancers.<sup>18</sup> The study, *Analysis of Cancer Incidence Patterns Among Former Employees of Stauffer Chemical*, by Raul Quimbo, is the analysis of matched data between Stauffer Chemical Company and the Florida Cancer Data System (FCDS).

FDOH asked the Social Security Administration to send a questionnaire, or information request to a listing of former employees provided by Stauffer. The listing contained 2,567 names, 13 of which did not have social security numbers. A total of 208 former employees responded to the request. The employee listing was also submitted to FCDS, and 153 individuals reported 171 incidents of cancer.<sup>18</sup>



More than 80 percent of the cases were among persons 55 years or older.<sup>18</sup> Forty-two cases of prostate cancer and 30 lung and bronchial cancers were reported.<sup>18</sup> The report recognized that some employees may have moved to other states.<sup>18</sup> The study provided the following conclusion:

### **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 the 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 was in operation. Further epidemiological analysis will not be possible until the additional information, as previously identified above, is available.<sup>18</sup>

### **Addendum to the Public Health Assessment on the Issues Surrounding the Off-Site Slag (ATSDR, 8/1999)**

On August 6, 1999, ATSDR issued an addendum to the public health assessment, relating to the off-site slag in Tarpon Springs and related areas.<sup>19</sup> The addendum was in response to a public petition received by the agency in February 1998. In May 1998, ATSDR staff members visited Tarpon Springs and met with residents to gather information. In August 1998, personnel from EPA Region IV and EPA's National Air and Radiation Laboratory in Montgomery, Alabama, took samples from road beds and residences.<sup>19</sup>

The addendum provided the following conclusions, recommendation, and public health action plan:

## **Conclusions**

- Phosphate slag from the Stauffer Chemical Superfund site reportedly has been used as concrete aggregate in homes, roads and roadbeds in the Tarpon Springs and Holiday, Florida, vicinity.
- Although there is elevated background radiation from radium-containing slag and aggregate, the total background dose to a maximally exposed child in residence #1 is roughly the national average background dose of 300 mrem per year.
- Annual background dose contribution from building materials to the maximally exposed child in residence #1 does not exceed the NCRP's recommended limit of 500 mrem per year.
- Phosphate slag at sampled vicinity properties, does not appear to contain sufficient leachable heavy metals to represent a public health hazard, based on current medical, epidemiological and toxicological information.
- Combined exposures from driveways and roads containing phosphate slag are not a health threat.

## **Recommendation**

ATSDR recommends that public health education be provided to help the public better understand that the phosphate slag is currently not a general public health hazard, and that information be provided to community members on the environmental health effects presented in the Stauffer Chemical Vicinity Properties public health assessment addendum.

## **Public Health Action Plan**

The public health action plan for the Stauffer Chemical Vicinity Properties contains a description of actions to be taken by ATSDR and other government agencies at and in the vicinity of the site after the completion of this public health assessment. The purpose of this public health action plan is to ensure that this public health assessment not only identifies public health hazards but also provides a plan of action designed to mitigate and prevent adverse human health effects resulting from exposure to hazardous substances in the environment.

Upon request from the public, the Florida Department of Health (FDOH) will develop and implement an environmental health education program to help community members understand the potential for past exposure and to provide information on assessing any adverse health occurrences that might be related to phosphate slag.

### **Health Consultation on Private Wells in Tarpon Springs (FDOH, 8/1999)**

On August 13, 1999, FDOH's Bureau of Environmental Toxicology issued this health consultation regarding Tarpon Springs private wells.<sup>20</sup> The 4-page document, authored by Randy Merchant, environmental administrator, cites 21 references. According to the health consultation, there are about 230 private wells and 9,500 residents (citing 1990 census data) within a 1-mile radius of the site. The health consultation is based on test results from six wells which were analyzed for metals, radionuclides, radium-226, and radium-228. The report provided the following child health considerations, conclusion, and recommendation:

#### **Child Health Considerations**

Because children may consume water from these wells, the health effects from exposure to chemicals in young children are a special concern. Children are smaller than adults, resulting in higher doses of chemical exposure per body weight. Children are often more sensitive to the effects of chemical exposures than adults and can sustain permanent damage if toxic exposures occur during critical growing stages. Most importantly, children depend completely on adults for risk identification and management decisions, housing decisions, and access to medical care.

As detailed in the discussion section above, children are not likely to be exposed to chemicals in private well water at a level sufficient to cause any illness.

#### **Conclusion**

Based upon the information received, we conclude that carcinogenic and non-carcinogenic illnesses are unlikely in children or adults from exposure to chemicals in private well water near the Stauffer site.

#### **Recommendation**

Because there is continued community concern about chemicals in private well water near the Stauffer site, the Florida Department of Health recommends that, until site remediation is completed, periodic well samples be analyzed for site-related chemicals to ensure timely detection of any increases. If additional information becomes available concerning chemicals found in private wells near this site, FDOH will evaluate that information to determine what actions, if any, are necessary.

### **Former Stauffer Employees Receive Worker Safety Announcement in 1996**

On July 25, 1996, former workers of Victor/Stauffer were provided a worker safety announcement. Stauffer Management Company gave FDOH the social security numbers of

former workers. FDOH forwarded the materials to the Social Security Administration (SSA) for mailing to current addresses on file with SSA.<sup>21</sup> Included with the worker safety announcement was an information letter former employees could give their physicians.<sup>22</sup> The materials were used to assist in the production of the report *Analysis of Cancer Incidence Patterns Among Former Employees of Stauffer Chemical*.

**FDOH Compiles List of Illnesses Reported by Former Stauffer Employees**

FDOH received 59 calls from former workers who had received the materials.<sup>23</sup> FDOH developed a system to document information from the calls, without personal identifying materials.

One physician called about a patient, but gave no health information. Seven employees called to request information and did not mention health, good or bad.

Table 1 summarizes illnesses former workers reported (the total may exceed 59, because some workers cited more than one ailment).

**Table 1. Number of Illnesses Reported by Former Stauffer Employees**

<b>Illness</b>	<b>Number</b>	<b>Illness</b>	<b>Number</b>
Ankle/leg swelling	2	Kidney problems	1
Bladder cancer	2	Lost both kidneys	1
Bronchial asthma	1	Lung problems	7
Breast cancer	2	Lung cancer	4
Broken back (accident while an employee)	1	Melanoma	2
Cerebral hemorrhage	1	No health problems	9
Cervical cancer	1	Prostate cancer	1
Colon cancer	1	Sinus problems	1

**Table 1. Number of Illnesses Reported by Former Stauffer Employees (Cont)**

<b>Illness</b>	<b>Number</b>	<b>Illness</b>	<b>Number</b>
Dermatitis	1	Skin cancer	4
Esophageal cancer	1	Skin lesions	1
Eye melanoma	1	Skin problems	6
Heart blockage	1	Skin warts	2
Internal bleeding	1	Thyroid cancer	1
Jaw cancer	1	Vascular necrosis of joints	1
Kidney cancer	1		

**Various Public Education Programs Are Instated**

In 1996, FDOH produced a public information update, bearing the logos of both ATSDR and FDOH. This educational flyer, distributed by Stauffer Management Company, stated that “There are no chemicals from the Stauffer Plant off the site.”<sup>24</sup> The update received wide distribution, which included appearing in the local newspaper.

On June 10, 1997, Christopher Teaf, Ph.D., a contractor for FDOH, conducted a grand rounds educational session at Helen Ellis Memorial Hospital to educate physicians and community members on health issues concerning the site.<sup>25</sup>

A summary document, dated May 1998, regarding the 1998 health consultation on the Gulfside elementary school was distributed in the community.<sup>26</sup>

In early 1999, FDOH and ATSDR began workgroup meetings to develop a public education program in conjunction with community members. Although the group worked for 8 months, local participants were unsatisfied with the project. A preliminary draft update presented to the group was found unacceptable.<sup>1</sup>

Representatives of ATSDR Region IV, have attended numerous meetings and information sessions in Tarpon Springs. Carl Blair, the ATSDR regional representative, represented the agency at most meetings, including those conducted by EPA Region IV.

## Chapter 4: General Discussion

Tarpon Springs area citizens have questions regarding the documents the government produced to review the environmental health of those who live near the site. They also question the quality of documents prepared in the past. Through numerous meetings, letters, phone calls, and ombudsman hearings, community members have clearly voiced their desire to know how their health was, is, and will be impacted by the site.

ATSDR and its state partner, the Florida Department of Health (FDOH), have produced a public health assessment (PHA), an addendum to the PHA, and a series of health consultations (HCs) relating to the site, the wells, and the Gulfside elementary school. However, concerned citizens still have questions, particularly relating to the issue of past exposure.

ATSDR defines a PHA as:

The evaluation of data and information on the release of hazardous substances into the environment in order to assess **any current or future impact** [emphasis added] on public health, develop public health advisories or other recommendations, and identify studies or actions needed to evaluate and mitigate or prevent human health effects; also, the document resulting from that evaluation.

While this definition does not mention past health impacts, the past is, and must be included in the determination of current health impacts, because past conditions may have caused current conditions.

Determining health impacts from the past is very difficult and in some instances may be nearly impossible. Yet, an effort must be made to determine the impact of the operations on the health of the local population. Information may exist at one point, but may be destroyed at another. Memories also fade with time. Therefore, initial efforts must be thorough and attempt to research every data source, which was not done for the Stauffer products.

## **Air Pollution**

From the instant the plant became operational, there were complaints of air pollution. In June 1948, less than a year after the plant's opening, eight local residents and landowners filed a nuisance suit (for gases and fumes) in the Federal District Court for Southern Florida, Tampa Division (II-1). The suit alleged that fumes and gases from the operation were adversely impacting human health and plants, not only in the immediate area, but as far as 8 miles away, and that,<sup>27</sup>

noxious gases and fumes escape therefrom through smokestacks connected with the said plant and by other means and are carried by the prevailing winds over a radius of some four miles from the said plant, that the said gases and fumes are highly deleterious to animal and plant life for the said distance, cause throat irritations and coughing by persons and animals breathing same and the death of young fowls, that said gas is especially harmful to teeth and causes decay and kills and destroys plant life.<sup>3</sup>

### ***Turnpaw's Deposition (Plaintiff)***

In his deposition, J.M. Turnpaw alleged that emissions from the plant not only damaged plants on his property, but also created problems for his refinishing boat business:

I noticed the lead paints or anything you put on the boats they would discolor, and sometimes would be spotty or kind of blurry on the paint and I went over it two or three times to try to catch it, if it wasn't quite dry... I varnished several boats like that and noticed the dust and smoke coming from over there, and you could take hold of it just like a piece of paper and pull it off the boats.

When asked how long the problem lasted, Turnpaw stated, "That all depends a good deal on the conditions of the weather and the winds, and with other conditions. I noticed it more with a west or northwest wind, I get that gas smell in the atmosphere."<sup>27</sup>

When asked if the emissions affected his health, Turnpaw replied, "Mouth dry and tasted like a mouth full of old copper." When asked if he coughed, Turnpaw answered, "Quite a bit, yes sir."<sup>27</sup>



***Flanagan's Deposition (Plaintiff)***

In her deposition, Genevieve Flanagan indicated that problems with gases and fumes began to be bothersome at her trailer park in January 1948, causing her to cough and sneeze and creating complaints from her tenants. She said the following:

We smelled it, to begin with, and could see it, and then many trees started dying. It killed a lot of them [trees and shrubs] and it is killing my pine and oak trees as well. All of the natural pines turned completely red, and two oak trees died within a week, the water oaks the leaves just burned; the others lost a lot of their leaves but some of the growth has come back; I don't know whether they will live or not; and two of the large water oaks died within that week, and one orange tree died. All of my palms. As soon as they put out a new leaf by the time they were out two or three weeks they turned. The plumoso palms, I trimmed a lot of them, about two weeks, and just as fast as they put out the new growth they just turned again.<sup>27</sup>

***B. Mickler's Deposition (Plaintiff)***

Bartley Mickler stated in his deposition that since the plant opened, he had lost livestock. He indicated that he lost a lot of pigs and about 100 head of cattle.<sup>27</sup> Mickler admitted that it is normal to lose cows in the winter months, about 10 per year, but he indicated that the past winter had been 200 to 300 percent worse.<sup>27</sup>

Mickler also indicated that pine trees on his 5,000-acre property were affected by the plant. He indicated that in January or February 1948, he noticed pine needles turning red and brown and falling from the trees.<sup>27</sup> His estimate was that at least half of the trees were impacted. New growth would bud and die back without being replaced. Mickler stated that less grass and berries have caused damage to quail and game birds. The grass normally comes out the first of the year, but prior to the lawsuit, the grass came out and died, resulting in grass production being down by 40 percent. Mickler also stated that fumes and gases from the plant settled on palmetto bushes on his property. Samples from palmettos and pine from across his property were sent to the state plant board for analysis.<sup>27</sup>

Mickler traced the damage based upon the way the smoke from Victor traveled, at least 7 miles from the plant.<sup>27</sup> He described the smoke this way: “It looks like a hazy gas substance and you can see it settling for miles and miles through the woods under the tops of the trees.” When asked if you could hold it in your hand, he answered,

It is filte [sic] red, gassy looking substance that you see settling on the grass and stuff, and you notice it floating through the woods and see it gradually settling down. Some of it is a black substance that you can see in the river. It looks like soot, an oily substance on the surface of water, and little black particles that look like soot or something. About three quarters of a mile from the plant, down towards the mouth of the river, I noticed it. It goes up and down the river with the tide.<sup>27</sup>

***S.E. Mickler’s Deposition (Plaintiff)***

Bartley Mickler’s father, S.E. Mickler was a well respected individual in the community, having served as constable, deputy sheriff, police officer, and chief of police. He represented the interests of his sister and her husband, Arthur and Ethel Glass, who lived in New York.

Prior to the construction of the plant, Mickler objected to the possible fumes and dust from the new facility and met with Paul Crider who worked for Victor. Crider told Mickler that, “You need not worry about it Mickler, it will not happen here with out plant.”<sup>27</sup> Afterwards, in the latter part of January or early February, “When it commenced killing stuff,” Mickler asked to meet with mayor Howard, who indicated that he would call Crider.<sup>27</sup> Mickler recounts how nothing was done,

He [mayor Howard] said it looks bad; ‘I will take it up with Mr. Crider right away.’ So several times I phoned him and he hadn’t done anything, and I phoned Mr. Beckett, the county commissioner, about it and he promised to go out and look at it. There was never anything done about it at all. I came to the commissioners’ meeting and told them about it here and a bunch of us got up a petition and carried one copy to the city commissioners and one copy to the Clearwater County commissioners.<sup>27</sup>

Approximately 300 people signed the petition. Mickler indicated that around January 1948, he began noticing offensive odors and harmful effects from the plant. He stated that he had smelled the odors in Tarpon Springs, and as far as 6 to 7 miles in the pastures. Mickler stated that, “It has

been so thick up there in low spots when the atmosphere would bring it down that it would be just like a fog.”<sup>27</sup>

When asked about the smell, Mickler replied,

Well, it don't smell like sulphur. It smells like a burnt phosphate to me. Of course, knowing that there is phosphate there, it makes you think of that more than anything else. It makes your throat dry, and you taste it, and it tastes kind of coppery. I get asthma from it, just like Mr. Crider stuffed up yesterday. I can go out here and get into the way the wind is blowing and be in it three minutes and have to take something for my throat. Yes sir, I cough.<sup>27</sup>

Regarding damages to trees, Mickler said,

Well, I came in to dinner in town and I never noticed anything. When I came back out, and just as I went to make the curve, as you run by the oil company and go up towards the plant, I noticed the leaves on the trees being red. I stopped my car and said to myself, 'dam there has been a fire since I have been along.' I stopped the car and looked and there wasn't no fire. I observed the trees had been burned by something, I don't know what.<sup>27</sup>

Mickler estimated that one-sixth of the trees on his property were affected. He carried samples of pine needles and palmettos to a Tampa chemist, who reported that some of the materials showed 300, 400, and 500 parts per million of fluorine. Mickler further indicated that he helped Archie Clement, Tarpon Springs city attorney, gather materials and that the city manager had sent the samples to the State Plant Board in Tallahassee. Representatives of the Forestry Department visited the Mickler property four or five times. Mickler recounted that, “They said it had to be fumes or gas or something. They said it was not the weather, dry or wet.”<sup>27</sup>

According to Mickler, the emissions looked like a fog, and from a distance an observer could not see through the mixture.<sup>27</sup> Trying to describe the emissions which impact the plants, Mickler stated that,

You can see it on oak or palmetto anywhere in the woods. It is a kind of dusty concern, although not much dust to it, either. It looks oily. For instance, on the palmetto, when it first hits it, it will limber up and look like it has oil on it. It limbers up a leaf and kind of parches it.<sup>27</sup>

*Crider's Deposition (for the Defense)*

Paul Crider, plant superintendent, stated that the plant processed elemental phosphorus, slag, and ferro phosphorus. Crider stated that since the second unit was started, the plant employed water scrubbers for the gases, in which water is sprayed into the gases. Crider did not seem to know much about the process. When asked "If the cleansing system has not been cut (turned) on, the gases and fumes will frequently escape, will they not?" he answered, "I suppose they would."<sup>9</sup>

Crider was asked the following question: "I notice that, at your plant there are high, apparently concrete smoke-stacks, and also what appear to be iron pipes. Do all of the fumes and gases escape through these smoke-stacks and pipes, or through either one of them?" Crider replied: "Through either one of them. That is, they escape from either one, at will. That is, as set by the operator. Not indiscriminately."<sup>9</sup>

When asked if he knew anything about the chemical content of the gases and fumes escaping from the plant, Crider answered, "No Sir." He was then asked if anyone at the plant knew about the content, and he answered, "No. Not reliably."<sup>9</sup> The questioner then asked for a more detailed explanation, and Crider answered:

Well, I will say this: in any process where you are burning fuel it is a matter of knowing how much oxygen you have got in your waste gases, or how much carbon monoxide, in order to control the combustion. As far as the operation is concerned, we people in the operation are not concerned about any other content, and, therefore we do not know.<sup>9</sup>

Crider indicated that some complaints had been reported to the company about the gases and fumes. When asked what changes, if any, had been made as a result of the complaints or subsequent to them, he answered, "No physical changes have been made; in a general sense the procedure has been to improve operation."<sup>9</sup> The deposition depicts Crider as someone who has little knowledge of phosphate or the extraction process. When Crider was asked four specific questions, he had to return to the stand the next day with the answers.<sup>9</sup>

*Claypool's Deposition (for the Defense)*

Victor Chemical also submitted to the court the deposition of John Claypool, an expert witness, **questioned only by Victor's attorneys**. Claypool was from West Hempstead, Long Island, New York. He received a B.S. from DePauw University in Chicago, and took advanced and special courses in the College of Agriculture at Purdue University, Indiana, until 1912. He taught pre-vocational and vocational agriculture and in 1916 went to Southwestern Teachers College as a professor of agricultural education. In 1920, he worked for a chemical manufacturing company and a copper smelting company in New York, taking over the investigation and experimentation of the effects of certain smokes or gases and fumes. Over the next 30 years Claypool studied the effects of gases or chemicals in eight states, including Florida.<sup>6</sup>

Claypool first visited Tarpon Springs on March 1<sup>st</sup>, 1947, while the plant was under construction.<sup>6</sup> Of the findings on this visit, he stated,

Vegetation in that vicinity at the time was not in a good state of growth. There had been an early season of drought, followed by unseasonably cold weather. Some plants, notably the pines, showed a scorched appearance of needles in places. It was not universal... There were dead trees in the vicinity, ...confined to the pine family... I also found some dead citrus trees in a small orchard near the Victor site. In looking over plant life in Tarpon Springs, I covered, as closely as I could without trespassing or attracting undue attention, within a radius of two miles in all directions.<sup>6</sup>

Claypool estimated that five to 10 percent of the pines in the area were dead. He also said that he saw two men remove and replace dead trees in the citrus grove. The workers explained that the trees had died of either root rot or crown rot and that the orchard had not been well fertilized or sprayed.<sup>6</sup>

When asked about the appearance of vegetation, Claypool said,

Vegetation, generally speaking, did not appear to be in a fine, flourishing condition at all, anywhere... I would not say that it was universally scorched in appearance. I did not trespass to examine closely. From the roads, there were signs that there had been a fire at some time. I was not acquainted with the plant, I did not know whether this was a seasonal

thing, whether fire brought those conditions about, but that was the condition of the scrub palmetto at the time... Pale green to yellow.<sup>6</sup>

Claypool showed photos made at the Mickler property purporting to display dead trees. The photos were black and white and after duplication did not provide details of damages. The witness was careful to establish that no trespass occurred, and indicated that he approached the property to within 10 yards, and used field glasses to observe plants and trees for about ¼ mile.<sup>6</sup>

On February 18 and 23, 1948, Claypool returned to Tarpon Springs in response to a request from Victor, because of unrest among neighbors of the plant and the conditions of vegetation.<sup>6</sup> Again, with the plant in full operation, Claypool surveyed the area for approximately 2.5 miles in all directions, and describes what he found on this trip:

In February of 1948, there was some noticeable discoloration of the tips of pine needles or foliage within a distance of a half mile in generally southeast or east-southeast direction. There was, on the date of my arrival, which was the 18<sup>th</sup>, some loss of green color on the tips of pine foliage, which by the 23<sup>rd</sup>, upon my return, had become a definite browning of those tips. That appeared to extend almost to the location of some oil tanks along the Anclote River, which is less than a half mile from the operating part of the plant... I continued my close-up inspection by walking along the railroad tracks to the north and found no evidence of anything unusual to vegetation in that direction. There was no noticeable damages to the Flanagan and Turnpaw properties... Foliage (westerly or northwesterly) appeared to show no change since my visit a year before... Sunset Hills, the general condition of vegetation appeared to be better at that time than it had the previous year.<sup>6</sup>

When asked, "Well from your experience of more than 30 years, did you form any opinion as to the cause of the discoloration of the pine needles and foliage at Tarpon Springs?" Claypool answered, "In my opinion, it was caused by a gas or fume... I believe it was probably from a fluoride compound."<sup>6</sup>

In May 1948, 2 weeks before the lawsuit was filed, Claypool returned to the area. He told the questioner,

The pines on what I have later learned was the Mickler property north of the Victor plant showed, in the case of ten or twelve trees near the fence, a reddening of needles. These trees were spread out over a width of 200 to 250 yards. In looking through the trees along the fence, I could see evidence of fire, but no evidence of fire near these particular trees.

[Near the Flanagan and Turnpaw properties] There seemed to be a reddening of pine needles, some loss of green color of broad-leafed plants, extending in a southeasterly direction from the Victor plant, affecting the pine trees, which I could see from a distance up to or almost to what I now understand to be the Flanagan property.<sup>6</sup>

[Toward Anclote] There seemed to be no evidence of any such condition as I have just described in the other direction, unless it could have been right up to the edge of Meyer's Cove, which is the Meyers' property adjoining the Victor property.<sup>6</sup>

[At Meyer's Cove] There was some browning of needles, some marginal loss of color of broad-leafed plants. I remember a persimmon in particular, but nothing of any severity.<sup>6</sup>

[At Sunset Hills] There was, at the foot of Florida Avenue, on some pines, small ones, a suggestion of tip injury.<sup>6</sup>

[Near the plant] There was some discoloration of sweet potatoes growing there and of the weed vermifuge. Just across what is known as Anclote Road, that little residential property, there was a gum, I believe it was a gum, that showed some such discoloration of foliage.<sup>6</sup>

[Inside the Victor fence] I cannot be certain as to that [discoloration]. I believe there was some as seen by the glasses. They are very big trees. Some faint signs of some discoloration up there in the tops. There was no excessive defoliation of the pines.<sup>6</sup>

Later that same month, Claypool returned to Tarpon Springs. Since his visit 2 weeks earlier, he noticed that "Appearances had improved by May 26<sup>th</sup>. By that time, new growth had become where it was visible within the area I inspected, especially in February, and that normal new growth made the reddened condition of the old needles less conspicuous."<sup>6</sup> The witness indicated that there was no new foliage on oak trees, and no change in the scrub palmetto, gums, weeds, and other foliage.<sup>6</sup>

In June 1948, after receiving notice of the lawsuit, Claypool returned to Tarpon Springs. During this visit, he claimed that,

I found no evidence whatever of any fume or gas damage in the vicinity of the plant. I found evidence at Tarpon Springs, Victor and between Tampa and this area of severe drought. It was reported that in the months of May and June up to that time, rainfall had been less than one-fourth of normal. Fires had been obviously, a frequent occurrence throughout that area.<sup>6</sup>

The questioner asked whether the witness was saying *no evidence*, or *no new evidence*. Claypool replied, "No evidence of any new. The pine needles that had shown some discoloration back as far as February were still discolored. They never regained their green." When Claypool was asked if there was some evidence of perhaps fume or gas damage or, at least, a damage of some kind, he answered, "Yes, yes."<sup>6</sup>

Claypool indicated that there was a problem with his investigation during the June visit, "Foliage growing on the ground had been largely destroyed, excepting the scrub palmettos, they had survived, were still there. But the undergrowth of weeds and what-not had been destroyed." He indicated that there had been some fires, but not near the plant.<sup>6</sup> Claypool also stated that despite the dry season leading up to the June inspection, trees were making a normal recovery, that new growth was continuing and that new candles or terminal growth were unmarked.<sup>6</sup>

During a July 1948 visit to Tarpon Springs, Claypool found no evidence of additional injury to plant life.<sup>6</sup> In September 1948, he found no evidence of additional damage by discoloration.<sup>6</sup> In April 1949, Claypool returned to Tarpon Springs and inspected the area with Harry Paul and Paul Crider, employees of Victor. He declared that,

I saw no evidence of injury on the properties of the plaintiffs themselves in so far as I could see. The Turnpaw property, for instance, I saw from the vantage point of a residence just west of his occupied by a Mr. Stansbury, I believe. This was the first time I had ever been down that close to the property. There were some pine trees on that property, tall ones, that seen through glasses showed some red needles, but I had no particular reason to believe that they were caused by any gas or fume because there was no definite path of injury leading up to them. For instance, four big pines on the Stansbury property were unmarked.<sup>6</sup>

[On the Flanagan property] I saw nothing abnormal in the appearance of vegetation, as nearly as I could see at all.<sup>6</sup>



[On the Mickler property] There was no change in the appearance of the property as it adjoins the Victor plant... [On the 10 to 12 trees mentioned in the May 1948 visit] I found those trees and they were in a flourishing condition... Well, I mean by flourishing, that the new growth, the candles, as I believe they call them, were really exceptionally good in appearance as to size and no sign of discoloration whatever. New growth had not taken the place of all of the old growth.<sup>6</sup>

*Claypool may have qualified as an expert if the test were applied in the court in the late 1940s. However, no such review was conducted and no grant of expertise status was granted by a court. Furthermore, the following should be noted:*

- *Counsel for the plaintiffs did not cross-examine the witness.*
- *Examinations were conducted from a distance (the closest was 10 yards), without trespass, with field glasses. One plaintiff owned more than 5,000 acres and leased 600 more, which would be difficult to view with field glasses.*
- *The witness was provided as an expert in damages to trees and plants, yet he was not sure as to what new growth on pine trees (candles) was named.*

#### ***Other Depositions (for the Defense)***

Herman Justice, factory accountant, was deposed on behalf of Victor, and testified that approximately 175 persons were employed at the plant, with about 140 to 145 working in operations.<sup>9</sup> He also indicated that as he passed along he had observed discoloration of pine needles for about 4 months, and that prior to the plant starting operations he had not made such observations.<sup>9</sup>

Victor Chemical's third employee deponent was E.A. Holtgrewe, who was in charge of operations at the plant. He stated that his duties were to operate the various processes at the plant, in the prescribed manner, as handed to him by Crider. When asked what temperature the rock is subjected to in the kiln, Holtgrewe answered, "That is a question that is pretty hard to answer. I don't know as I could give any light on that." He also did not know if other elements are removed from the rock during the heating process, besides moisture and phosphorus. He further

did not know what the furnace temperature was or whether the phosphorus released during the process was a gas and if it was condensed.<sup>9</sup>

Holtgrewe was asked if white or gray vapors escaped the plant, and answered,

Yes sir. There are visible signs of some vapors... I am quite sure they are not coming from any of the stacks... Well, I have never seen any vapors come from the stacks... There is some smoke that raises off the slag as it is tapped from the furnace... It is the only vapor that is visible from any distance. What you may have referred to before as vapors coming from the stack is vapors coming from the scrubbing tower, which is dissipated within a short distance of the scrubbing tower.<sup>9</sup>

Holtgrewe also indicated that since about March, he had noticed pine trees just south of the plant turning brown, but he did not know if they were dead.<sup>9</sup>

### ***Stauffer is Being Investigated (1948-1970s)***

In late spring and during the summer of 1948, governmental agencies were receiving and responding to citizens complaints. On May 17, 1948, Dr. John McDonald, director of the Florida State Board of Health's Division of Industrial Hygiene wrote to Dr. Paul Haney, director of the Pinellas County Health Department, regarding a complaint. McDonald indicated that three trips had been made on May 13 around the Stevens home and conditions were the same as the day before.<sup>28</sup>

McDonald spoke to Crider, who seemed to think tree damage was from tree borers. Crider had asked the plant chemist to take samples of the discharge, but little progress had been made. Crider was, "reticent about details of the process involved in the plant," and asked McDonald to seek permission from the Chicago office to visit the plant.<sup>28</sup>

McDonald stated that he had taken a sample of rain water collected from a nearby roof for analysis.<sup>28</sup>

On June 4, 1948, Archie Clement, Tarpon Springs city attorney, saw J.J. Taylor, state chemist, in Tallahassee regarding samples that Joe McCreary, Tarpon Springs city manager, had sent to the chemist. Two jugs of water were also delivered for analysis.<sup>29</sup> On June 14, 1948, Taylor sent results of tests on vegetation to McCreary. Sulfur content of the samples was found to be within a normal range, but the fluorine content was considered excessive.<sup>30</sup>

On June 14, 1948, McDonald again wrote to Haney, indicating that he had completed the analysis of water samples from the first week of June. The samples showed an increase in sulfate, more chlorides than expected, and phosphates in excess of 0.1 parts per million. He also reported that a private lab had discovered high concentrations of fluorine in pine needles taken near the plant.<sup>31</sup>

On December 9, 1948, McDonald and his staff discussed the plant's operations and complaints from the public with executives from Victor. Literature was presented to Victor showing that conifers are particularly sensitive to sulfur dioxide (SO<sub>2</sub>), with injury occurring from prolonged exposure to levels as low as one part per million. While other parts of the discharge were discussed, it was decided that SO<sub>2</sub> was the agent of importance. McDonald stated that,

The members of the Division feel that the officials of the company are willing to undertake the reduction of the discharge of sulfur dioxide from the scrubber tower. We also feel that conditions at present have improved from what they were last May. In the early months of the plant's operation, the escape of gases was not well controlled.<sup>32</sup>

### ***Air Monitoring Begins in 1977***

Little to no information is available regarding air pollution from the 1950s through mid-1970s. The available data is limited to meteorology, SO<sub>2</sub>, particulate, and ozone.<sup>33</sup> The general information available is discussed in Chapter 7. One worker, Harland Kingsley, said that "You could hardly see for the dust. Your nose would be full of black dust, your whole face was black." His co-worker, Vernon Hudson added, "It was hell. The steam and slag and dust flying all the time. You could hardly breathe."<sup>34</sup>

In July 1977, an air monitoring station was installed near the southeast corner of the plant. Air samples for SO<sub>2</sub> were collected by a 24-hour bubbler and 3-hour continuous monitoring. Sulfur dioxides near the plant exceeded the Florida standard until 1980, when a dramatic decline occurred, coinciding with the time Stauffer began to shut down the plant.

Table 2 shows the maximum annual SO<sub>2</sub> levels from 1977 to 1981.<sup>13</sup>

**Table 2. Maximum Annual Sulfur Dioxide Levels from 1977 to 1981**

Year	Sulfur Dioxide			
	24-Hour Bubbler		3-Hour Continuous	
	mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>	ppm
1977	715	0.28	1877	0.72
1978	907	0.35	1550	0.60
1979	592	0.23	2026	0.78
1980	201	0.08	569	0.22
1981	149	0.06	463	0.18

In December 1979, PED Co Environmental, Inc., a contractor for EPA Region IV, conducted a field inspection of the facility and found that many parts of the operation complied with applicable air standards. However, inspectors found problems with the furnace and the slag pit areas. Allowable emissions for the furnace were listed at 30.566 pounds per hour (lb/hr) (tapping) and 30.09 lb/hr (flushing).<sup>35</sup>

While the furnace complied with particulate emissions, the hood did not capture all emissions. The total emissions were estimated at 83.4 lb./hr, plus the uncontrolled hood loss. The inspectors commented that,

The major reason for the emission of uncontrolled particulate emissions from the flushing and tapping operations are the intense heat of the slags and the quantities produced... It is our opinion that improvements in hood design can reduce fugitive emissions within the

furnace area, but the emissions from the slag pit and slag run out of the building cannot be controlled by hooding.

The particulate sources, with the exception of the tapping operation, appear to be well controlled and operated at near peak performance. The emissions from the slag tapping operations, however, appear to have impacted on local total suspended particulate levels. The submicron nature of the plume and its low level of release do not allow adequate dispersion of the emissions.<sup>35</sup>

Ronald Roberson, industrial hygienist for the Tarpon Springs plant, said in a deposition that, “When I started in ‘72 there were approximately, I would say a dozen pieces of pollution equipment in the plant, largely types of bag house dust collectors, scrubbers, that type of thing.”<sup>36</sup> He stated that the dust collection equipment was added to the kiln in 1975 or 1976.<sup>36</sup> Roberson also indicated that the plant was having problems with fugitive phosphorus pentoxide ( $P_2O_5$ ), and that, “There was quite a bit of fugitive  $P_2O_5$  emissions in the area.  $P_2O_5$  is very easily—is very visible, its very easy to detect by sight. It’s white in color and very dense.”<sup>36</sup>

Jerry Harris, the plant manager at the time the plant closed, stated in a sworn deposition that the plant at Tarpon Springs was similar to the plant in Silver Bow, Montana.<sup>37</sup> In 1979, the National Institute for Occupational Safety and Health (NIOSH) did a health hazard evaluation determination (Report No. 79-8-584) regarding the operation of the Silver Bow plant. According to the report, “A potential health hazard did exist at the time of the survey due to excessive airborne concentrations of  $P_2O_5$  and respirable crystalline silica.”<sup>38</sup> Employees were overexposed to both contaminants. In his testimony, Harris admitted that the Tarpon Springs plant had been cited in 1979 by the Occupational Health and Safety Administration (OSHA) for dust violations.<sup>37</sup>

In his 1985 deposition, Eugene Anderson, a Stauffer employee for 33 years (working his way into management) made the following remark that confirmed what many had thought was the truth, that for many years, little to no pollution control equipment was used at the plant:

Q: Of your own personal knowledge, do you know whether Stauffer Chemical Company had environmental control devices to either catch or warn of the existence of certain things in the atmosphere or the working environment of the employees out there?

A: At what stage of the game are you talking about?

Q: Well, let's take it from either last first or when you first started.

A: When I first started there was no controls whatsoever.

Q: What happened over time?

A: Over the period of thirty-three years they put in different collection equipment.

Q: Scrubbers?

A: Scrubbers.<sup>39</sup>

Complaints about air pollution were documented until shortly before the plant closed. On March 4, 1980, Joyce Gibbs, chief of the Pinellas County Air and Water Quality Division, transmitted a memorandum entitled "Summary of Stauffer Chemical Company Complaints," to Jacob Stowers, director of the Department of Environmental Management, outlining 30 complaints from May 19, 1975, to December 9, 1979. One complaint was accompanied by a petition signed by 24 persons and nine letters asking the state to deny Stauffer's proposed permit. Another complaint was a log of fugitive particulate emissions with photos.<sup>40</sup>

From May to July 1979, the owners of Flaherty Marina, adjacent to the plant, kept a log of emissions problems.<sup>41</sup> Personnel at the marina complained of burning eyes and throat, headache, nausea, tightness of the chest, and difficulty breathing until the fog passed.

Dan Flaherty, owner of the marina, told the ombudsman that emissions from the plant damaged the high-gloss paint on a boat in the marina and that he had to completely repaint the boat. He further alleged that with all his complaints, nothing was done until he called the attorney general.<sup>42</sup> On April 12, 1997, Flaherty told the *St. Petersburg Times*, "That stuff was toxic

enough that when they had one flash in the furnace building, several hundred pigeons were killed. They were flopping in the air.”<sup>43</sup>

Table 3 is a record of the log entries.

**Table 3. Conditions in the Area as Recorded by Flaherty Marina Personnel in 1979**

<b>Date</b>	<b>Time</b>	<b>Conditions</b>
May 31	07:50 p.m.	Couldn't see, even with headlights (seven witnesses)
June 11	06:10 p.m.	Complete blackout, seemed to come from about base of new stack
June 15	12:11 p.m.	Complete visibility loss
June 16	08:30 a.m.	Complete visual obscurity
June 18	03:12 p.m.	70% visibility loss
June 20	04:00 p.m.	90% visibility loss
June 23	01:10 p.m.	100% visibility loss
July 04	08:10 a.m.	100% visibility loss
	09:10 a.m.	90% visibility loss
	10:10 a.m.	70% visibility loss
	10:40 a.m.	75% visibility loss
July 15	11:45 a.m.	90% visibility loss (See exhibits 7 and 8)

On October 11, 1979, a warning letter (No. 52-79-10-168) was sent to Stauffer, resulting from complaints of excessive smoke, fumes, odor, and particulate emissions. The letter, prompted by citizen complaints and subsequent inspections/surveillance, listed seven identified violations.<sup>44</sup> Stauffer responded to the letter and specifically outlined revised efforts to control P<sub>2</sub>O<sub>5</sub> and particulate emissions.<sup>45</sup>

In March 1980, a petition with 149 signatures was sent to Gibbs, expressing concern regarding air emissions and the health of children and wildlife.<sup>46</sup>

**Exhibit 7. Flaherty Marina Experiences Visibility Loss When Stauffer is Operating  
(Looking South Toward the Marina from Near the Plant Fence Line)**



**Exhibit 8. Flaherty Marina Experiences Visibility Loss When Stauffer is Operating  
(Looking North Toward the Plant from Near the Fence Line)**

On April 17, 1980, an air pollution episode occurred at Stauffer when the electric arc furnace malfunctioned and was shutdown. Visual emissions tests yielded average emissions of 69.5% and 93.75% in a 6-minute period. During a 1 ½ -hour period, a suspected P<sub>2</sub>O<sub>5</sub> cloud was observed and did not abate, engulfing the building and extending for ½ mile or more downwind. The prevailing winds carried the plume east-southeast over populated areas.<sup>47</sup> The episode occurred at 9:15 a.m. and emissions were visible until 6:15 p.m.<sup>48</sup>

On February 6, 1980, Jean Graf, a research scientist for IIT Research Institute, sent a letter to Wayne Martin, of the Pinellas County Air and Water Quality Division, discussing results of air samples from the plant. She concluded that fugitive emissions relating to materials handling are the main cause of total suspended particulate (TSP) levels near the plant.<sup>49</sup> In letters to Martin on October 12,<sup>50</sup> and November 2, 1979,<sup>51</sup> Graf detailed the findings of the microscopic analysis of air emission samples. She reported indications of “a strong impact from calcium phosphate source which, I presume was a processing plant producing phosphates for fertilizers.”<sup>41</sup>

The TSP standard of 60 µg/m<sup>3</sup> was violated in Pinellas County from May 1, 1977, through the second week of August 1981.<sup>52</sup> TSP and SO<sub>2</sub> violations were recorded from 1977 to 1980 in Tarpon Springs, with the 24-hour TSP standard being violated 4 times, the 24-hour bubbler SO<sub>2</sub> standard being violated 5 times, the 3-hour continuous SO<sub>2</sub> standard being violated 10 times, and the 24-hour continuous SO<sub>2</sub> standard being violated 17 times. The TSP standard was met or exceeded six times in 1978 and 1979, and nearly reached another nine times.

On February 25, 1980, Gibbs sent a memorandum to the director of the Florida Department of Environmental Management, summarizing the micro file on Tarpon Springs.<sup>53</sup>

Table 4 recounts the data, which was not originally in table format.

**Table 4. Microscopic Analysis of Tarpon Springs TSP Filters\***

Date	TSP	Material/% Weight	Comment	
04/26/78	185	- Quartz, feldspars	8.3	Phosphate processing emissions were the primary sample components
		- Carbonates	9.1	
		- Recrystallized sulfates, nitrates	10.1	
		- Roasted, raw phosphates	33.1	
		- Coke	7.3	
02/08/79	162	- Recrystallized sulfates, nitrates	14.0	Phosphate processing emissions were the primary sample components
		- Roasted, raw phosphates	26.0	
		- Coke	15.0	
02/26/79	130	- Quartz, feldspars, carbonates	8.8	Phosphate processing emissions were the primary sample components
		- Recrystallized sulfates, nitrates	17.3	
		- Roasted, raw phosphates	29.9	
		- Coke	18.0	
04/15/79	136	- Quartz, feldspars	7.9	Phosphate processing emissions were the primary sample components
		- Carbonates	9.5	
		- Recrystallized sulfates, nitrates	11.0	
		- Roasted, raw phosphates	35.6	
05/21/79	98	- Quartz, feldspars	7.6	Traffic impact was relatively strong
		- Carbonates	18.2	
		- Recrystallized sulfates, nitrates	11.41	
		- Raw, roasted phosphates	6.7	
		- Coke	6.7	
		- Semi-fused fe-rich phosphates	12.4	
06/26/79	110	- Quartz, feldspars	12.61	Wind and traffic suspended soil were the major sample components. The local phosphate plant was a <i>relatively</i> minor source.
		- Carbonates	6.810	
		- Recrystallized sulfates, nitrates	.6	
		- Roasted, raw phosphates	12.0	
07/20/79	108	- Quartz, feldspars†	–	Emissions from phosphate rock processing were very minor sample components
		- Carbonates	–	
		- Rubber tire fragments,	–	
		- Recrystallized sulfates, nitrates	–	
07/26/79	80	- Quartz, feldspars	–	–
		- Carbonates	–	
		- Rubber tire fragments,	–	
		- Recrystallized sulfates, nitrates	–	
		- Roasted phosphates	–	

\*TSP: Total suspended particulates.

†Due to the nature of paper, percentage weights cannot be given.

On October 23, 1978, Larry George, of the Florida Department of Environmental Regulation (FDER), now the Florida Department of Environmental Protection (FDEP), wrote a memorandum to Dave Puchaty, of FDEP, regarding an August 15, 1978 report by Dames and Moore for Stauffer. George wrote the following:

This report substantiates the Department's position that the SO<sub>2</sub> ambient violations near Tarpon Springs are due almost entirely to emissions from the Stauffer Chemical Company phosphate kiln stack. Included in the report are ambient data collected by the company at a site 0.31 km north of the plant which indicate 10 exceedances of the 24-hours standard and 8 exceedances of the 3-hours standard during 1977.<sup>54</sup>

In 1979, the highest pollutant standard index (PSI) value recorded in Tarpon Springs was 400, with SO<sub>2</sub> listed as the responsible pollutant. This value was the highest in Florida, by nearly three times. The average PSI value for Tarpon Springs was 25, which was near the bottom for averages.<sup>55</sup>

In January 1979, FDEP issued an air emissions delayed compliance order to Stauffer.<sup>56</sup> Compliance measurement of the Stauffer plant was a problem. Peter Hessling, of the Pinellas County Air and Water Quality Division, told the ombudsman that,

To the best of my knowledge, they never actually completed a stack test while I was inspecting, from 1980 forward. Something always went wrong, something was missing or didn't work. The main problem was when they tapped the furnace. It looked like the gates of hell glowing in the dark, it gave off steam and lots of emissions-phosphorus pentoxide.<sup>57</sup>

In 1981, after Stauffer ceased operations, the air quality in Pinellas County improved markedly. The 1983 air quality report cited a 28% reduction from 1980.<sup>58</sup>

Table 5 details emissions from 1978 to 1983.

**Table 5. Stationary Sources Emissions Inventories (Tons/Year)<sup>59</sup>**

Emissions Type	Year					
	1978	1979	1980	1981	1982	1983
Particulate Matter	1,155.19	1,308.64	1,956.50	1,139.82	868.59	549.08
Sulfur Dioxide	27,813.39	31,859.57	33,652.55	30,241.61	27,312.68	17,838.80

In response to the worker safety announcement sent to former Stauffer employees, one former employee wrote that:

Even in the early days of plant operation our local manager had controversies with Tarpon Springs government officials. The city complained many times about the fumes, smoke, and dust, which the wind carried across the river and over the city.

The slag at the furnace had to be cooled by spraying with water. This generated huge clouds of steam into the air above us, and over the city.

Our manager finally ordered [name-withheld] to install a wind direction-and-speed monitoring device on top of the water tower. We ran a cable from the furnace building to the wind machine, and in the furnace building installed a strip-chart recording instrument. This continuously recorded the changes in the wind. The chart was replaced and studied daily. Whenever city officials complained about pollution from the plant, our manager would descend on city hall armed with data and able to exploit any slight discrepancies in the verbal testimonies being given by the citizens. We had them at wits end by showing their figures in error—their wind drift and speed out of order—so more confusion and bad feelings.<sup>59</sup>

Other factors contributing to questions in the minds of the public are spills and uncontrolled fires which occurred at the plant. Little information was made available to the public to reduce fears when incidents occurred.

George McCall, of the Pinellas County Health Department, frequently spoke with plant management. He told the ombudsman that, “There were noticeable emissions when the slag was pulled out, but they tried to improve and reduce emissions in about 1961, or 1962 with collection systems. They looked good to me. They had phosphorus pentoxide, total phosphate and

fluorides.” McCall also indicated that a ring of 10 sampling stations were installed near the plant.<sup>60</sup> None of the air emissions data has been discovered.

While little data exists to determine air emissions during the plant’s operation, we know that complaints were registered throughout its years of operation. Therefore, it is reasonable to conclude that the plant had problems with air pollution during the entire period of the operation.

### **Asbestos**

Confusion has reigned regarding asbestos at the site. Initially asbestos was listed as a contaminant of concern to be removed later. While consideration should be given to the present and future health impact, exposure possibilities were much higher during the operation of the plant, and therefore, the issue of asbestos should focus on any past impact asbestos may have caused.

Allegations of asbestos being used “by the boxcar load” were made in meetings regarding the site. Because little information to confirm or deny the allegations was ever given, the public remains confused at best and uninformed at worse. However, we can logically surmise that large amounts of asbestos would be required for a kiln which heats rock to approximately 2900F.<sup>61</sup>

The case of Eugene Anderson, a former Stauffer employee who filed a workers compensation claim against Stauffer, illustrates the magnitude of asbestos use at the plant. Anderson won the case and Stauffer was ordered to pay his medical bills and disability penalties for crippling lung disease (\$60,000, plus \$14,000 a year). The judge, Gary Frazier, said that,

The claimant was exposed to asbestos fibers when he helped unload burlap bags of asbestos from railroad boxcars. At times the silica dust would be so thick that the claimants clothes would be covered with dust. Moreover, the claimant was exposed to phosphoric pentoxide gas that is given off during the manufacturing process carried out at the plant... [there is] Competent and substantial medical evidence [that Anderson’s problem stems from his] exposure to asbestos and/or silica dust at the employer’s plant.<sup>62</sup>

On August 15, 1985, Dr. Leonard Dunn, was deposed regarding Anderson's workers compensation claim, and was asked to clarify Anderson's health history. According to Dunn, the history "said that he was exposed to some environmental problems, such as asbestos. At that time he did not mention other things. Later he did,"<sup>63</sup> and, "The operator also has to keep asbestos fibers packed around the three electrodes to keep air from the furnace."<sup>64</sup>

In an April 9, 1986 memorandum, Howard Acosta, Anderson's attorney, wrote the following regarding Anderson's work history:

Mr. Anderson was exposed to raw asbestos fiber, silica and phosphorus pentoxide gas. (When phosphorus pentoxide mixes with water it becomes phosphoric acid according to the Stauffer industrial hygienist. It is considered an irritant to the lungs.)

#### **Asbestos Exposure**

From 1949 until approximately 1955, Mr. Anderson was exposed to Johns Mansville asbestos fibers shipped in burlap bags. At that time, he was in the yard department, the phosphorus department and the kiln department. While in the yard department he unloaded hundreds of bags of asbestos fibers from railroad box cars on at least 6 occasions.

Asbestos dust was evident in the air during the unloading. For approximately 1-2 years, beginning in 1951, he worked as a furnace switchboard operator. The furnace had three large electrodes which protruded from it. There was a gap between the electrode and the wall of the furnace which was four inches wide and approximately nine feet long, per electrode. This gap had to be continually filled with raw asbestos fiber. Part of Mr. Anderson's job was to empty bags of raw asbestos fiber into a bin. Then, on a daily basis, he would shovel the raw asbestos fiber into the gap between the furnace and electrode.

Also on a daily basis the pressure inside the furnace would occasionally blow out the fibers in a certain part of the gap, creating additional dust. Mr. Anderson would then have to repack the fiber. Ordinarily maintenance of the gap required **a shovelful of the raw asbestos fiber at least four times per hour** [emphasis added]. No respirators were worn during any asbestos exposures and there was no ventilation in the area. During the first five years on the job his clothes were so dusty from asbestos and phosphate rock dust that he would have to leave them outside his home at least twice a week. Between 1953 and 1963, he worked in the phosphorus handling area of the furnace department. During this 10-year period he was exposed to asbestos dust just on a daily basis when he relieved the switchboard operator for lunch. He averaged a shovelful of asbestos fiber per lunch hour to fill the gap between the furnace and the electrode.

From 1963 until 1983, Mr. Anderson worked as a supervisor/foreman. During this period he would have to tear out 90 feet of asbestos rope used in another part of the furnace and install new rope. He would have to make 9 cuts a week with a hacksaw during the installation process. He would also have to clean up the fibers from the tear out procedure. He was not required to wear a respirator during this procedure until 1975.

Mr. Anderson occasionally insulated steam and hot lines with asbestos fibers from Johns Mansville. He mixed it with Portland cement and repaired and insulated steam lines on at least 30 occasions during the 1950s and 1960s.<sup>64</sup>

During a July 28, 2000 meeting with Stauffer Management Company and its attorney, the ombudsman presented the likely scenarios of asbestos exposure and the loss of the asbestos:

- The asbestos fibers were released into the air,
- The asbestos fibers were released into product or slag, or
- The asbestos fibers went into the lungs of the workers.

In response, Michael Kelly, Stauffer's attorney wrote the following:

I provided you earlier with extensive asbestos soil and air monitoring test results. That data, which includes soil and air monitoring testing performed at Gulfside Elementary School, establishes, quite convincingly, that the Tarpon Springs site presently does not present any asbestos related health risk. Asbestos has not been found either at the Tarpon Springs site or at the Gulfside School, in the air or the soil, at levels even approaching health risk levels.

During our July 28 meeting you expressed concerns that, in the past, the Tarpon Springs site generated unsafe amounts of asbestos and that you cannot account for such large quantities of the material. As I understand your argument, you assert that huge quantities of asbestos were generated and that those quantities are no longer on site. You propose that the asbestos went off-site, perhaps along with slag shipments. You point to a finding of 33% asbestos in a sample taken in connection with the State of California investigation of Rhône-Poulenc, as support for asbestos contained in offsite slag shipments.

Your argument, however, is founded upon two false premises. As more fully set forth below, you cite no credible evidence that workers at the Tarpon Springs facility were exposed to unsafe quantities of asbestos. Further, there is no evidence that unsafe quantities of asbestos are contained in off-site slag, or even on-site slag. The 33% reading to which you refer relates not to slag but to an on-site pipe at the California facility involved in the Rhône-Poulenc investigation.



1) Eugene Anderson

You contend that Eugene Anderson, a former Stauffer employee, was exposed to substantial quantities of asbestos during his employment. You were kind enough to provide us with a copy of “Exhibit 6 ” to Mr. Anderson's workers compensation hearing. That exhibit is a memo, dated April 9, 1986, in which the author states that Mr. Anderson, during his employment, would shovel raw asbestos fiber into a gap that existed between a furnace and an electrode and that “ordinary maintenance of the gap required a shovelful of the raw asbestos fiber at least four times per hour.”

The April 9, 1986 memo you reference, however, in addition to describing a process which is illogical on its face, was written by Howard Acosta, one of the lawyers who represented Mr. Anderson in his workers' compensation proceeding. Mr. Anderson's actual testimony provides little support for the statements contained in Mr. Acosta's memorandum. As you know, Mr. Anderson testified extensively at the workers' compensation hearing. On page 37 of Mr. Anderson's testimony (enclosed), he states, under oath, that he could not quantify the amount of air “particlets” [sic] he was exposed to as a Stauffer employee. He mentions only that he was exposed to unquantified levels of the following: silica dust, coke dust, nodule dust, rock dust, lime dust, asbestos (p.37). On page 59, Mr. Anderson also states that he could not specify the concentrations of contaminants to which he believed he was allegedly exposed.

I also urge you to review publicly available Stauffer employee dust monitoring information, which I understand were provided to you by Ms. Mosley. That information includes air-monitoring results for respirable dust, total dust, and other compounds. We submit that the above referenced data is inconsistent with Mr. Anderson's lawyer's and Mosley's claims that Stauffer workers were exposed to continuous, high levels of chemicals in the work environment.<sup>65</sup>

*It should be noted that the ombudsman was not contending, but rather was presenting information in his possession and seeking input from Stauffer.*

Kelly seeks to make much of the fact that the memorandum is from Anderson's counsel, and implies that it cannot be trusted for that reason. However, being a plaintiff's counsel, does not a liar make. Furthermore, the facts outlined in Acosta's April 6, 1986 memorandum were corroborated by Dr. Dunn, who presented a similar exposure as reflected in his deposition of April 30, 1983, some 3 years earlier. Therefore, one could conclude that if the story has been fabricated, the multiple parties have done unusually well in manufacturing the exact same story each.

Additionally, it seems unreasonable to expect an employee—who is not a scientist—to specify the concentrations of contaminant to which he is exposed. It is important to note that nowhere in the letter to the ombudsman, did Kelly allege that Anderson’s statements were in error, nor does he deny that massive quantities of asbestos were used. There is no explanation of where the asbestos—the use of which was not denied—was going. Kelly also calls Anderson’s remarks that four shovelfuls of asbestos were used hourly to repack the electrodes “illogical.” It may be illogical, but the question presented to Stauffer concerned the truth of the allegation, and on this point there is silence.

A good argument could be made that it is illogical to design and operate a system that needed packing or repacking, at least on a frequent basis. However, Anderson did not design the system, rather he served to assist in its operation. If Anderson’s statement is in error, there are a number of former employees who could confirm or deny the allegation.

Evidence of the abundant use of fibrous asbestos is available in statements made by Stauffer employees and legal representatives, during the November 25, 1986, initial phase of Anderson’s workers compensation claim trial. Charles Bentley, representing Stauffer and its insurance carrier stated that,

Defense took those depositions, and the focus of that testimony was on the alleged use of powdered or fibrous asbestos.

And the evidence will show that those procedures (packing raw asbestos around the electrodes-added) were implemented from the forties to the mid-fifties, and that was **state-of-the-art thereafter** [emphasis added], different procedures, different state-of-the-art, and finally it developed into a water seal procedure.<sup>66</sup>

While the packing of asbestos may be illogical according to Kelly, one of Stauffer’s attorney, it was nevertheless state-of-the-art, as confirmed by Bentley, another Stauffer attorney!

Additional evidence from Zeneca, Stauffer’s parent company, indicates that at least part of Anderson’s statement was true. On March 14, 1997, Frank McNeice, site manager, sent a letter

to Maxwell Kimpson, remedial project manager for EPA Region IV, and enclosed the asbestos survey report. McNeice stated that,

The report presents the results of a survey conducted at the site in 1990, in anticipation of demolition of various site structures. Also Jerry Harris has been told of asbestos use in the production operations for things like sealing around furnace electrodes and sealing the discharge end of the roaster, etc.<sup>67</sup>

Additional information supports the massive asbestos uses at the plant, as the following statements from former workers, whose names are withheld, show:

On November 14, I wrote a letter to my friend who had been furnace supervisor during my years at the plant. I received back a postal card from his widow. In it she describes his death from colon cancer and asbestos-laden lungs. In your letter you mentioned the community concern about asbestos at the plant. When I read [name withheld] mention of asbestos in [name withheld] lungs, I immediately concluded that much asbestos was in [name withheld] office on the third floor of the furnace building, only yards away from the upper end of the furnace electrodes where the greatest heat was. I'm thinking that [name withheld] office used ample asbestos to protect him from the furnace heat! Perhaps the entire inside of the furnace was covered by asbestos. I'm also thinking that the office on the kiln's 'burner deck' was also lined with asbestos for the operators protection. The office got a lot of dust when the slag crusher operated.<sup>60</sup>

We had a mud plant to make fire clay. We used bags of stuff in the bricks, seemed to be asbestos or white insulation. We used it around the furnace for exposed wires. The only safety equipment was long sleeve shirt, ankle top boots, hard hat, visor and most people bought leather gloves.<sup>60</sup>

In the 1970s we used the rope form of asbestos, we brought it in by the boxcar.<sup>68</sup>

To argue the non-existence in the face of credible evidence of asbestos being used at the plant and harming workers, presents an interesting argument. Stauffer is saying that the physicians who testified in the case—and the judge—reached a conclusion in error. There may be a question as to the volume of asbestos used, but it is clear that asbestos was used in tremendous amounts.

During the July 28, 2000 meeting with Stauffer, as one of the possible scenarios, the ombudsman presented evidence from a California case in which Stauffer plead *nolo contendere* (no contest) to a felony count of violating the California Health and Safety Code, Section 25189.5(B).

Stauffer was found guilty, but asked the judge to have the felony conviction reduced to a misdemeanor, to which the state did not object. Stauffer paid \$324,175 to the district attorney's office, \$170,000 and \$26,650 to the Los Angeles fire department, and \$154,175 to the UCLA School of Engineering and Applied Science for scholarships, a total of \$675,000.<sup>69</sup>

The case is relevant here, because Stauffer had placed materials from the Tarpon Springs plant's clarifier in railcars and one such car ended in Los Angeles. In gathering materials in support of the case, samples were taken from contents of the railcar and the surrounding. One sample, PTO208908/SJ91419, returned with a 33% asbestos content.<sup>70</sup> The ombudsman asked if this was an indication that the missing asbestos was going into the product. Stauffer presented information, a sample evidence log, indicating that the sample was taken from a rusted pipe, 1 foot above ground at the north-eastern side of the property, east of the storage tank-powdered foam. The sample, described as white insulation, does appear to have come from a source other than the contents of the railcar.<sup>71</sup>

In October 1980, Delta Environmental Consultants conducted an asbestos survey at the site. While inspecting the buildings, they found 59 building materials with potential asbestos. They found the following three major types of asbestos use in 32 samples:<sup>72</sup>

- Thermal system insulation for piping, pipe fittings, tanks flue, and stack insulation,
- Surfacing materials, including spray and trowel-applied fireproofing, and acoustical materials, and
- Miscellaneous materials, including gasket materials, vinyl floor tile, ceiling tile, adhesives, mastics, and packing or caulking materials.<sup>73</sup>

In the process of removing the plant and cleaning up the site, Stauffer demolished some of the buildings, and some of the materials removed from the site contained asbestos. In November 1995, McNeice reported that 200 cubic yards of asbestos had been removed during the January-February 1992 demolition, and transported to a landfill in Mississippi.<sup>73</sup> A waste shipment record

of February 14, 1992, included 10 cubic yards of asbestos insulation.<sup>74</sup> The asbestos would fill a room 8 feet high, 68 feet long, and 10 feet wide.

On May 2, 1987, Bruce Tuovila, then of FDOH, wrote to Maxwell Kimpson, remedial project manager for EPA Region IV, indicating that, “No soil samples have been analyzed for asbestos or silica dust to determine if there is a potential for these contaminants to be present in any dust that might be generated if on-site soils are disturbed.”<sup>75</sup>

During the May 1997 footing excavation activities, two air samples detected asbestos structure.<sup>76</sup> In July 1998, Parsons Engineering Science, Inc., issued a site-wide asbestos sampling report to Stauffer.<sup>77</sup> The site was split into 147 squares, 200 feet long by 200 feet wide. A computer randomly selected three spots in each of the squares for sample gathering. The three samples from each square were then combined to make a composite sample.<sup>229</sup>

Kimpson asked EPA’s Region IV Air Division to review the air monitoring results during the tank removal. Caroline Robinson, an environmental engineer, indicated that 275 volume/liter air was collected over 58 minutes. She also stated that,

For TEM monitoring of asbestos fibers and structures, at least 1200–1800 liters of air would need to be collected by a monitoring pump in order to ensure that the pump was at least measuring 10 liters per minute of air for approximately 120 minutes. However, since the monitoring was for only 58 minutes, the <0.0140 structures per cubic centimeters would not be very conclusive of the amount of asbestos fibers in the air during the excavation project.<sup>77</sup>

In August 1997, at the request of the Pasco County School Board, E.E.& G. conducted baseline air monitoring for asbestos at the Gulfside elementary school, using two sample locations outside the school building and three locations inside the building. Asbestos was not detected in any of the samples.<sup>78</sup>

Between July 10 and August 11, 1997, School Board contractors collected 10 air samples (four outside and six inside the building) and 21 surface soil samples (0-3 inches deep) from the school

grounds. The air samples were analyzed for phosphorus, P<sub>2</sub>O<sub>5</sub>, phosphoric acid, and asbestos. Soil samples were analyzed for total phosphorus, phosphoric acid, and asbestos. In September 1997, contractors collected three soil/aggregate samples from beneath the pavement, two samples of asphalt paving materials, and one sample of roofing aggregate from the school building. These samples were not analyzed for asbestos.<sup>14</sup> While the sampling was discussed in the health consultation for the school, and in the information flyer regarding the consultation, the results detailed were not reported.<sup>73</sup> None of the soil samples contained asbestos.<sup>14</sup>

Parsons, a Stauffer contractor, also took samples at 147 locations using polarized light microscopy (PLM). One sample, from near the parking lot of the main office, was asbestos-positive. An additional 46 surface soils and 20 at-depth samples were collected and analyzed using PLM. One asbestos-positive sample, chrysolite (a common type of asbestos fiber), was found near the maintenance building (exhibit 9).<sup>77</sup>

Altogether, 18 of 68 air samples were found to have asbestos structures.<sup>77</sup> Previously, during the excavation of footers at the clarifier in May 1997, two out of 12 samples contained asbestos, but were within the background concentration for urban areas.<sup>77</sup>

From these materials, it is clear that asbestos was used extensively at the plant. One shovelful of asbestos, weighing 2 pounds, used four times per hour, 24 hours a day, for 50 weeks a year, amounts to 67,200 pounds of asbestos per year, or 33,600 pounds if the shovelful weighed only 1 pound. And this is only the amount used at one point in the operation.

Therefore, it is obvious that a great amount of asbestos had to go somewhere. Because asbestos is light, 1 pound would constitute a large volume. Using the shovel measurement of 1 to 2 pounds each, over the life of the plant (approximately 32 years), means that between 1.06 and 2.15 million pounds of asbestos fibers were likely used just to pack the electrodes. The question then is, “Where did all these asbestos fibers go?” Since asbestos does not burn, one must look at other possibilities— including workers tracking asbestos home on their clothes.

**Exhibit 9. Soil Sample Grid Site Map of Stauffer Chemical Company**

## Local Wells

A major health issue or concern among citizens of Tarpon Springs is the impact of consuming water from local wells. Questions exist regarding the impact of contaminants from the plant and the communication of the surficial and Floridan aquifers, as stated in the 1993 PHA.<sup>4</sup>

A review of 1985 (8 years before the PHA) data submitted by Stauffer suggests communication between the aquifers occurred. George Ellsworth and Gardner Strasser, of FDEP, wrote a memorandum to Kirk Johnson, also of FDEP, stating that,

The data also suggest there is a direct connection between the Floridan and the surficial aquifer and that this is due to lack of a competent confining layer. A gravity driven contaminant plume could descend through the incompetent confining bed into the Floridan in the absence of an upward gradient.<sup>79</sup>

Johnson wrote to Harris, the plant manager, saying that, “It appears that the facility has had an impact on the surficial aquifer below the site which may impair the use of the adjacent Anclote River.”<sup>80</sup>

Tests performed between 1987 and 1993 had suggested that a clay layer separated the two aquifers. However, a 2000 new report by Black and Veatch, found that the clay layer may not be uniform.<sup>81</sup>

Among the concerns regarding all wells, public or private, in the surficial or Floridan aquifer is the impact of operations at the site. Stauffer never held, nor applied for an industrial wastewater permit, thus no effluent discharge records are available. These concerns are compounded by Stauffer’s use of a large number of lagoons or ponds. On October 6, 1981, Sam Sahebzmanai, sent a memorandum to Harry Kerns (both of FDEP) suggesting that Stauffer should apply for a discharge permit to discharge “phossy water into the impoundment located on their [Stauffer] property...phossy water normally has a low pH level, high fluoride, high cyanide, some nitrates and some arsenic.”<sup>82</sup> Exhibits 10 and 11 show the lagoons and ponds at the Stauffer plant.



On February 13, 1987, Craig Feeny sent a memorandum to Eric Nuzie (both of FDEP) recounting a conversation he had with John Gentry, a former Stauffer employee. Gentry indicated that “electrostatic dust precipitators were used on heated gases emanating from the calcining kiln and furnace. Dust collected by the precipitators were then hauled to an area located east of the plant and dumped into a pond.”<sup>83</sup>

With the potential for communication between the aquifers, concern increases regarding the drums buried on-site. At least 900 drums, containing an estimated 49,500 pounds of contaminated roaster fines, were buried on-site.<sup>84</sup> The drums had probably rusted and released the contents into the soils, and ultimately the groundwater.

### ***The Number of Private Wells***

There is confusion regarding the exact number of private wells in use near the plant, which range from zero to 230, depending on which study is consulted.

During this inquiry, questions were raised regarding nearly 200 wells in Tarpon Springs believed to have a sewer account, but no water account. This would likely indicate that the wells are being used for consumption.<sup>85</sup> While most of these wells are in the 2- to 3-mile range from the plant, a number are also within the 1-mile limit (exhibit 12).

There is always the possibility that wells in the area are being used for agriculture/yard irrigation and for other uses besides consumption. However, based upon the materials uncovered by this investigation, it seems that no one can say for sure how many wells exist, their uses and the source of their waters, and the impact on public health, past, present, or future.

Table 6 lists the number of wells which are quoted in various documents.

**Table 6. Numbers of Wells as Reported in Various Documents**

<b>Document</b>	<b>Number of Wells</b>
08/1993 preliminary public health assessment*	At least 5 private wells and 3 public wells
12/1993 final site remedial investigations report†	- 84 public and private wells within a 3-mile radius of the site - 31 private wells within 1 mile of the site - 12 public and 62 private wells between 2 and 3 miles from the site
01/1994 health consultation‡	No potable wells
07/1998 health consultation	100 private wells
08/1999 addendum to the preliminary public health assessment	100 private wells
08/1999 health consultation	230 private wells

\*The document also indicated that, “Public and private supply wells within 1 mile of the site draw water from the Floridan aquifer.”<sup>84</sup> However, this investigation has found no evidence of a survey to confirm this statement.

†Appendix H of the report contains a listing of the off-site wells.<sup>86</sup>

‡The document states that, “the surficial aquifer is not being used as a potable water source in the area. The nearest public water supply wells (which are in the Floridan aquifer) are located 1.5 miles southwest of the site on the opposite side of the Anclote River. There is no evidence of human exposure to contaminated groundwater from the surficial aquifer.”<sup>17</sup>

There is obviously a need for an accurate well survey for the area around the site. Although more accurate information exists for Pinellas County and Tarpon Springs, any survey should include a detailed determination of wells in Pasco County, near the site. Once the wells have been identified accurately, then, and only then, can a sampling plan be developed to adequately study any contamination.

**Exhibit 10. Ponds and Lagoons at Stauffer Chemical Company**

**Exhibit 11. Ponds and Lagoons at Stauffer Chemical Company**

**Exhibit 12. Private Wells in Tarpon Springs**

### ***Water Monitoring Results***

Wells in the area have sporadically shown contamination. In May 1990, Andrew Reich, of the Florida Department of Health and Rehabilitative Services (FDHRS, now FDOH) sent a memorandum to Michael Flanery, director of Environmental Engineering, Pinellas County Public Health Unit, indicating that wells in the area contained nickel, chromium, aluminum, and other metals. He also indicated that in the 1980s no contamination by inorganic compounds existed. Attached to the memorandum were the results of samples from four wells with violations of maximum contaminant levels (MCLs) for manganese, iron, chloride, color, and sodium.<sup>87</sup>

In June 2000, Tarpon Springs had to shut down all three of its drinking water wells. Mark Schroeder, supervisor of the city's water division, stated that high chloride levels in the wells indicated saltwater intrusion. Schroeder could not remember another time when wells were completely shut down due to saltwater intrusion. The Grosse Avenue well was off line for maintenance,<sup>88</sup> and Schroeder told the ombudsman that,

The well, which has been inoperative since December 1998, due to repairs being a non-budgeted item, and the intent of reactivating this well. This division is in the process of securing quotes for the purchase of motor, discharge housing, drive shaft, and column pipe for the installation of a vertical turbine type pump. Once in place, it is the intention of the city to reactivate this well site.<sup>89</sup>

Tarpon Springs has undertaken a large public information program to explain the quality of water dispensed by the city, using large fold-out leaflets, which discuss potential health impacts of contaminants, terms, abbreviations, and detection levels.

Tables 7, 8, and 9, detail the water sampling results of wells on and off-site.

**Table 7. Sampling of On-Site Water and Off-Site Monitoring Wells**

<b>Date/ Collector</b>	<b>No. of Samples (S) or Wells (W)</b>	<b>Contaminant and Amount</b>
<b>On-Site Shallow Groundwater<sup>4</sup></b>		
1985-89 EPA/ Stauffer	158 S	Antimony, arsenic, boron, cadmium, chromium, fluoride, lead, thallium, and vanadium: above background levels
	149 S	Radon: 73 samples above MCL* of 300 pCi/l†
	131 S	Radium: no samples above MCLs
<b>On-Site Deep Groundwater Wells<sup>4</sup></b>		
	10 S, 5W	Radon: 8 samples above MCL of 300 pCi/l
	2 S	Radium: no samples above MCLs
<b>Off-Site Shallow Groundwater from Monitoring Wells<sup>4</sup></b>		
EPA	9S, 3W	Arsenic, beryllium, cadmium, chromium, fluoride, lead and vanadium: above comparison values
	4	Radon: 2 samples above MCLs <b>Note:</b> No background samples were taken
<b>Off-Site Deep Groundwater from Monitoring Wells (3-1, p. 14)</b>		
1988-90 EPA and PCPHU‡	15 S, 13W	Arsenic, beryllium, cadmium, chromium, fluoride, thallium, and vanadium: above comparison values
	20S	Radon: Above MCLs of 300 pCi/l <b>Note:</b> No background samples were taken
03/1991 EPA	16 W	Arsenic detected in 3 shallow and 1 deep well <sup>90</sup>

\*MCL: Maximum contaminant level.

†pCi/l: PicoCuries per liter.

‡PCPHU: Pinellas County Public Health Unit.

**Table 8. Sampling of Off-Site Public Wells**

Date/ Collector	No. of Samples (S) or Wells (W)	Contaminant and Amount
1988-90 EPA/ PCPHU*	5 W	Arsenic, beryllium, cadmium, chromium, fluoride, thallium, and vanadium: above comparison values <sup>4</sup>
EPA (Reported in 1988 paper)	6 W	Radon: high levels as shown in each well: <sup>91</sup> - Between 4,757 and 4,864 pCi/l† - Between 1,465 and 1,482 pCi/l - Between 3,831 and 3,847 pCi/l
09/1990 Holiday Utilities	1 W	Unspecified contaminant: above the Florida Primary Drinking Water Standard <sup>92</sup>
04/1998	Grosse Ave. Well # 1‡	Gross Alpha reading of 6.2 <sup>93</sup>
04/1998	Tarpon Ave. Well #2§	Gross Alpha reading of 4.6 <sup>94</sup> <b>Note:</b> Following are additional readings: 03/15/99: 5.8 <sup>94</sup> 08/30/99: 4.4 <sup>97</sup> 12/01/99: 4.1 <sup>96</sup> 02/09/00: 5.7 <sup>98</sup>
04/1998	Highland Ave. Well #3	Gross Alpha reading of 2.8 <sup>94</sup> <b>Note:</b> Following are additional readings: 03/15/99: 1.9                      05/17/99: 2.9 <sup>99</sup> 08/30/99: 1.5 12/01/99: 3.4                      02/09/00: 4.2
02/1999	Moog Rd Well Pasco County	Antimony, thallium, arsenic, radium-226 cadmium, beryllium and chromium: high levels <sup>100, 101</sup> .
03/1999	Tarpon Springs Well # 2	Fluoride, sodium, chloride, sulfate, chloroform, bromodichloromethane, bromoform, and dibromochloromethane: above MDLs <sup>102</sup>
03/1999	Tarpon Springs Well # 3	Fluoride, lead, sodium, chloride, iron, chloroform, bromodichloromethane, bromoform, and dibromochloromethane: above MDLs <sup>102</sup>
04/1999	Tilson Well Pasco County	Gross Alpha levels of 12.8, radium-226 2.2 <sup>103</sup>
02-07 /1999	Moog Rd Well	Thallium - 14 ppb in February¶ - 10 ppb in March - 9 ppb in July
03/1991, EPA	20 S**	Arsenic in 3 shallow and 1 deep well

\*PCPHU: Pinellas County Public Health Unit.

†pCi/l: PicoCuries per liter.

‡The Grosse Avenue well is located less than 2 miles from the site.

§MDL: Method detection limit. EPA's current National Primary Drinking Water standard is 15 (pCi/l).<sup>104</sup>

¶ppb: Parts per billion.

\*\*Contractors lists 11 private wells within 4 miles of the site. Contractors took 20 groundwater samples from 16 monitoring wells, which were resampled, and 4 private wells.



**Table 9. Sampling of Off-Site Private Wells**

<b>Date/ Collector</b>	<b>No. of Wells</b>	<b>Contaminant and Amount</b>
1988-90 EPA/PCPHU*	6	Arsenic, beryllium, cadmium, chromium, fluoride, thallium, and vanadium: above comparison values <sup>4</sup>
03/2000 Pasco County Health Department	2	- 1 well above the manganese limit, lead and antimony detected - 1 well above the iron limit, arsenic, MTBE, TCE and thallium detected <sup>105</sup>
09/1990 Pinellas Co unty	6	Unspecified contaminant: above the Florida Primary Drinking Water Standard
04/1999 Pinellas Co unty Health Department	6	Metals, radionuclides, Radium-226, and Radium-228 - Maximum levels of arsenic: 8.9 µg/l† - Maximum levels of manganese: 230 µg/l - Maximum levels of radium: 3.7 pCi/l‡ <b>Note:</b> FDOH compared the results with tests from 1990 and 1997, and determined that the levels of arsenic and manganese were similar to those previously measured (see exhibit 13) <sup>20</sup>
06/1999	5	Tested for 17 contaminants - The three wells closest to the site (less than ¼ mile) have higher readings for radium-226, but not at harmful levels - Elevated levels of iron, sodium, and manganese
1989	1 (Holiday Lakes Estate)	Radioactive contaminants (the same ones found at Stauffer)
Summer 2000 Pinellas County Health Department	18§	-12 wells exceed levels for iron - 11 wells exceed levels for manganese - 6 wells exceed levels for sodium - 1 well exceeds the level for aluminum - 1 well exceeds the level for thallium - 1 well exceeds the level for radium-226 - 1 well exceeds the level for Di(2ethylhxy)Phthalate - 1 well exceeds the level for gross alpha - 1 well, directly east of Stauffer, exceeds levels for sodium, thallium, iron, manganese, and radium-226. <sup>86</sup> See exhibit 13.
03/1991, EPA	4 W¶	Arsenic detected in 3 shallow and 1 deep well. <sup>91</sup>

\*PCPHU: Pinellas County Public Health Unit.

†µg/l: Micrograms per liter.

‡pCi/l: PicoCuries per liter.

§17 out of 18 wells are within 1 mile of the site (exhibit 13).

¶Contractors lists 11 private wells within 4 miles of the site. Contractors took 20 groundwater samples from 16 monitoring wells, which were resampled, and 4 private wells.

**Exhibit 13. Pinellas County Sampled Wells Locations**

### ***Stauffer's Viewpoint Concerning Water Contamination***

Regarding the contamination of wells in the area, Kelly, Stauffer's attorney, provided the following comments:

Recent testing performed by Pinellas County officials indicates that some wells located near the Tarpon Springs facility are contaminated. However, contrary to the fears expressed by certain members of the community, the data contained in those reports do not demonstrate that the Tarpon Springs site is the source of any contamination in any off-site drinking water wells. Many of the constituents found in the recent testing are naturally occurring and there is no evidence that the Tarpon Springs site is the source of the contamination.

With respect to the recently published groundwater data, please note that of the 26 contaminants analyzed, only 9 were detected at levels above Florida drinking water standards. Of these, sodium and iron may be indicators of sources unrelated to the Tarpon Springs site, such as salt-water intrusion and/or local drought conditions. Sodium may be of concern only for people on salt restricted diets. Iron could possibly affect the taste or appearance of the water, but would not be of a health concern. Neither of these chemicals has been reported as a chemical of concern for the Stauffer site.

Radium-226 was found in one well at a level above the drinking water standard. However, radium occurs naturally in the groundwater aquifer in the Tarpon Springs area and was found between 0.24 and 10.1 pCi/l in groundwater in nearby Hillsborough County. While thallium and aluminum were found above drinking water standards once each in separate wells, subsequent resampling of both wells showed that the levels of these chemicals had declined below the drinking water standards. In the case of thallium, subsequent sampling results for that well were below detection limits.

DEHP occurred in only one well at a level just above the drinking water standard. However, DEHP has not been reported to be a chemical of concern at the Tarpon Springs site.

Manganese was found above the drinking water standard in 8 of the 18 wells that were tested. This element has not been reported as a chemical of concern for the Tarpon Springs site. In addition, FDOH has evaluated manganese found previously in private wells at levels comparable to those reported here and has determined that manganese at these levels does not present a health risk to either children or adults. A single gross-alpha measurement above the drinking water standard was found in one well across the Anclote River from the Tarpon Springs site. The corresponding radium-226/228 measurements are very low. Since radium is the main alpha-emitting radionuclide likely to be found in groundwater in the Tarpon Springs area, the significance of the gross-alpha measurement is not clear.

As you know, the Pinellas County Department of Health currently plans to continue to periodically test the wells located near the Tarpon Springs site. This additional information should provide a better understanding of the quality of the well water in the local area. Also, as part of the additional studies that SMC has agreed to conduct, some additional characterization of the groundwater at the site will be performed. Beyond that, EPA will oversee extensive groundwater studies (Operable Unit -2) after implementation of the “source” remedy set forth in the ROD [record of decision] (Operable Unit-i). I submit that any unanswered questions relating to groundwater will be addressed through these additional efforts, especially the Operable Unit-2 investigation. At present, as stated above, available data does not establish, or even suggest, that the Tarpon Springs site is the source of off-site groundwater contamination.<sup>66</sup>

### **Sediments and the Anclote River**

Residents are concerned that contaminants may find or may have already found their way into the Anclote River from the site. A look at Meyer’s Cove, circa 1942 (exhibit 14), shows that a large area of Stauffer property, under water from the river, was filled, probably with bag house dust and/or slag from plant operations. Either component would be laced with contaminants for ultimate release into the river and the sediments found in the waterway. The roadbed between the Stauffer fence line and the water body is made of the slag from the plant.

The Anclote River is a proud part of the Tarpon Springs assets, and locals are quick to seek to protect their river. For example, in 1987, when the U.S. Army Corps of Engineers proposed dredging and removing 70,000 to 80,000 cubic yards of sediment from the waterway, citizens voiced concerns<sup>106</sup> because they were afraid that the project would stir up pollutants in the water.<sup>107</sup>

A longstanding concern is how many contaminants from the many ponds and lagoons at the site reached the river, and in what quantities. Some of the ponds are adjacent to the river. In addition, at least 900 drums of contaminated roaster fines were buried on-site and cannot be found today, because the drums have probably disintegrated and released their contents into the ponds and lagoons.

**Exhibit 14. Meyers Cove and the Anclote River Circa 1942**

Carlene Hobbs, a Tarpon Springs resident, said, “I grew up eating fish from the river. There was so much phosphorus in the river...it would stick to their scales and you could see where the fish were at night because they glowed. They actually glowed.”<sup>107</sup>

In 1985, samples taken within 60 feet of the river showed traces of arsenic and manganese. Arsenic was reported at 190 parts per billion, three times the recommended drinking water standard.

In 1995, tests found cadmium, copper, mercury, nickel, silver, and thallium in the river water, while mercury was found in the sediment. However, the record of decision for the cleanup of the site indicates that of these contaminants only the mercury in the sediment was considered to be above the naturally occurring background levels.

### **Contaminants of Concern**

EPA has lowered the number of contaminants of concern from the original 30 to 16. Members of the public have alleged that the reduction was done without their input. A May 1996 EPA fact sheet listed the following contaminants:

Based in part, on the concentrations of contaminants found during the RI (remedial investigation) and the toxicity of this contamination, the contaminants of primary concern in soil at the site are Acenaphthylene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, 2-Methylnaphthalene, Benzo(g,h,i)perylene, Chrysene, Dibenzo(a,h)anthracene, Indeno (1,2,3-cd)pyrene, Arsenic, Antimony, Beryllium, Cadmium, Chromium, Cobalt, Fluoride, Lead, Manganese, Thallium, Radium-226, Lead-210, Radium-228, Uranium-238, Uranium-235, Actinium-227, Thorium-228, Uranium-234, Thorium-230, Thorium-232, and Radon-222.

EPA believes this contamination has the potential to cause adverse health effects and/or unacceptable increased risk of cancer unless the potential exposure is eliminated or decreased.<sup>108</sup>

In a February 3, 2000 e-mail, John Blanchard, the remedial project manager for EPA Region IV, told Mary Mosley that cadmium, chromium, and fluoride were carried through the risk

assessment process as contaminants of concern, but were not included in the record of decision (ROD), because their concentrations were within acceptable levels.<sup>109</sup>

In a February 15, 2000, e-mail Blanchard told Mosley that,

The ROD showed 24 contaminants of potential concern. The EPA eliminated nine of those based upon their low concentrations. That leaves 15 contaminants of concern that were carried through and listed in the ROD with remedial goal options. Radium-226 was added. Total: 16 contaminants of concern.<sup>110</sup>

Members of the public remain concerned that many of the original contaminants of concern have been removed from the list and are no longer being considered. Furthermore, while the present ombudsman report has shown that a very large volume of asbestos was used in the plant and remains unaccounted for, asbestos is **not** listed as a contaminant of concern.

### **Sinkholes**

Sinkholes are another major concern for citizens of the Tarpon Springs area. Although the site investigation has not considered this issue, the local area has had sinkholes. One specific concern is the issue of how sinkholes would impact water supplies in the area.

Sinkholes are, and have been common in Tarpon Springs, and Florida as a whole. According to the United States Geological Survey (USGS), “Sinkholes are a common, naturally occurring geologic feature and one of the predominant landlords in Florida, where they pose hazards to property and the environment.”<sup>111</sup> According to USGS, sinkholes develop most often in April and May.<sup>111</sup> While data for the 1990s is incomplete, the late 1980s were the most active in sinkhole formation, with more than 150 new formations in Florida occurring in 1985, 1987, and 1988. West-central Florida (the Tampa area) has seen its share of new sinkhole development.<sup>111</sup>

Sinkholes near Stauffer are not new. In the 1947 construction of the plant, Paul Crider, superintendent for Victor, visited S.E. Mickler, a local property owner, in an effort to purchase

water from a large sinkhole near the site, known as the Cobb Sinkhole.<sup>27</sup> Mickler did not own the property where the sinkhole was located, but he own the land leading to it.

Aerial photos show what are likely sinkholes near the plant. One photo shows what is an apparent sinkhole, northwest of the site and the Gulfside elementary school (exhibit 15). Since this property is near property owned by Mickler, this may be the Cobb Sinkhole.

In 1968, a sinkhole opened under the U.S. 19 bridge, the bridge then collapsed and two cars plunged into the water, killing one woman.<sup>112</sup> On September 19, 2000, a sinkhole was reported in the Tarpon Springs area, and an elderly couple was slightly injured when a 10 by 8 foot hole opened up and the car they were driving fell into the sinkhole. In addition, during the 1999 dredging of the Anclote River, four sinkhole developed not far from the site.<sup>113</sup>

During three hearings conducted by Congressman Michael Bilirakis and the EPA National Hazardous Waste ombudsman, citizens expressed concerns about sinkholes. During the February 12, 2000 hearing, Sandy Nettles, a hydrogeologist, spoke regarding his experiences with sinkholes. He stated that he had worked for 25 years in the county and for 10 of those had specifically been involved in sinkhole investigations. When asked if sinkholes were a problem in the area, Nettles said,

The area, in fact, the site itself—I have a whole series of maps here. In general the area is replete with sinkholes. There's numerous what we call relic sinkholes, sinkholes that collapsed 1,000 years ago, 10,000 years ago, but they are still active.

There are what we call cover-subsidence sinkholes, which don't have these large collapsed structures, but they're very slow-moving, have small ravel zones. They can be as small as an inch in diameter, four inches in diameter, or larger. They cause settlement over 10, 15 years.

Any structure built on top of them will ultimately fail, basically, unless they're designed specifically to span them. And from what I've seen of this site, and this site is what we call karst terrain. It's the limestone that has a great irregularity.<sup>113</sup>



**Exhibit 15. Apparent Sinkholes Northwest of Stauffer Chemical Company**

During an August 19, 2000 meeting of the Citizen's Advisory Group, a geological consultant for EPA, mentioned that the site is in an area prone to sinkhole formation. The consultant, Andrew Grimmke, of Black and Veatch, said that he had studied the area going back to the late 1980s and found numerous data gaps about the underground water characteristics and geology.<sup>114</sup>

The February 17, 2000 Black and Veatch draft data evaluation report, addressed recent sinkholes in the area of the site,

In the fall of 1999, the U.S. Army Corps of Engineers began maintenance dredging of the Anclote River channel. As a part of the dredging operation, a bermed dewatering pond which covered an area of approximately 10,000 square yards was constructed at a location approximately 3,000 feet due east of the main industrial portion of the Stauffer property. The purpose of this design is to allow the dredge spoils to settle and have the water decant and return to the river.

Within days of the initial use of the pond, four small collapse sinkholes had formed in and immediately adjacent to the point. According to the project engineer, construction of the pond required the removal of a layer of silt or clay approximately 2 to 3 feet thick above limestone. In addition, an inspection conducted by FDEP on January 14, 2000, noted that the pond bottom had several exposed and recently broken limestone pinnacles. Remnants of some of the removed pinnacle tops were also observed.

An investigation to determine the presence and location of karst features beneath the site property has not been conducted to date. Three closed depressions appear on the U.S. Geological Survey Topographic quadrangle on the northern portion of the site. These features may represent subsidence due to solutional activity in the subsurface. Alternatively, closed depressions may also have resulted from earth moving on the property.<sup>15</sup>

Questions still remain regarding the sinkholes. Have the sinkholes permitted communication between the surficial and Floridan aquifers, thus posing a threat to present and future drinking water supplies? Have the known sinkholes, like the Cobb Sinkhole, been filled with slag, precipitator dust, or other materials from the plant? If so, what impact do these materials have on the past, present, and future health of citizens? These questions are reasonable and must be answered in any future evaluation of health.

EPA Region IV is planning to conduct a study of sinkholes in the area and the potential impact on water supplies. In the study of health, consideration must be given to the impact of known sinkholes and the materials used as fill.

The Black and Veatch report suggested that tidal impacts on the groundwater,

A Coastal Groundwater Monitoring Program produced by SWFWMD is the result of efforts to develop and maintain a monitoring program for groundwater quality in areas potentially impacted by saltwater intrusion. The monitoring program utilizes a network of monitoring wells to establish the depth of fresh water and the position of the saltwater/freshwater transition zone along the Southwest Florida Coast. In the vicinity of the Stauffer site, the saltwater/freshwater interface is located within the Tampa and Ocala Formations of the Upper Floridan aquifer. Extrapolated from a cross section at New Port Richey, the saltwater/freshwater interface in the vicinity of the site is expected to occur at 50 to 100 feet below mean sea level (SWFWMD, 1995). These findings are consistent with sodium concentrations detected in wells completed in the carbonate zone during the RI. As expected, the RI also indicated that sodium values in all wells were closely tied to proximity to the Anclote River (Weston, 1993).

Onsite water level variations in response to tidal fluctuations have been documented in the Hydrogeologic Assessment and the 1993 RI Report. Seaburn & Robertson (1987) suggested that a regular reversal of the otherwise downward hydraulic gradient onsite occurred along the Anclote River shoreline in response to the tidal cycle. According to data collected by Weston (1993), the tidal cycle appears to have identical effects on both the shallow and carbonate zones. Simultaneous measurements collected from monitoring well clusters on Figure 4-13 of the RI suggest a profound connection between the shallow and carbonate zones and the Anclote River.

With respect to groundwater contaminant migration, tidal effects are expected to influence the groundwater flow system in the hourly or daily time scale, subjecting the site margin to short term fluctuations in flow rate and direction. The overall direction and gradient, however, are expected to consistently reflect discharge to the Anclote River.<sup>15</sup>

### **Buried Drums**

The issue of “buried drums” often comes up in public meetings. On August 5, 1985, Bruce McCellan, senior hydrogeologist for Stauffer, wrote the following to Sahebzmanai, of FDEP:

5) Exhibit 6-a Waste Data Sheet showing the composition of the drummed roaster fines disposed off-site. **The drums buried at the Tarpon Spring plant site contain phosphorus-contaminated roaster fines (calcined phosphate sand) very similar to the contents of the drums disposed of off-site at the Rollins Landfill.** [emphasis added]<sup>228</sup>

A “*Potential Hazardous Waste Site, Preliminary Assessment*,” form also indicates that drums were buried on site.<sup>115</sup> A *St. Petersburg Times* article in the summer of 1987, stated that 900 drums containing approximately 49,500 gallons of hazardous waste had been buried.<sup>85</sup> The hazardous ranking score for the site also indicates that at least 900 drums of 20% white phosphorus-contaminated roaster finds are buried on-site.<sup>116</sup>

In response to the worker safety announcement sent to former Stauffer employees, one former employee mentioned burying a drum with a backhoe,

While I certainly could not find the exact location after all these year, I do remember that we buried it in what was then a somewhat elevated area near the river bank in the southeast corner of the plant grounds... The incident may well not be the only time when large amounts of phosphorus were buried on the plant ground, since such accidents might well have occurred at other times without my knowledge. This did seem to be a standard procedure for dealing with such problems at that time.<sup>117</sup>

In a March 9, 1987 memorandum, Nuzie told Feeny (both of FDEP) that the buried materials are white/yellow phosphorus and that drums were buried prior to 1978, but not since then.<sup>118</sup>

Feeny provided Nuzie a conversation record dated February 19, 1987. On that date, Feeny had spoken with Jess Barkley, of the U.S. Army Medical Research and Development Lab at Fort Detrick, Maryland.<sup>119</sup> Barkley provided the following information:

Burial of waste phosphorus was not an unusual method of disposal during the 1940s to 1960s.

The decomposition of drums by the activity of phosphoric acid is accompanied by a buildup of white crust on the drums. The crust is composed of a multiplicity of compounds formed by various combinations of P and O.

The half-life of  $CM^3$  particule of white phosphorus is 2.43 years. (No temperature or  $O_2$  stated).

Solubility of white phosphorus in oxygen-free fresh water is 4.1 ppm at 25C.

Removal of buried drums containing 20% white phosphorus is advisable.

In a March 19, 1987 letter to Richard Ferrazzuolo of EPA Region IV, Nuzie offers the following modifications to the preliminary assessment for the site:<sup>120</sup>

1. Page 4, Line 8. This sentence should be changed to: “After learning about the burial of the phosphorus contaminated roaster fines and a subsequent meeting with Stauffer Chemical Company officials, FDER (Florida Department of Environmental Regulation) conditionally granted approval to leave the drums buried in place.”<sup>120</sup>

On January 27, 1987, George Nicholas of Anmar Construction Company, told a staff member of the Southwest District of FDER, that an anonymous caller had told him that drums had been encountered on property adjacent to and west of the site. Nicholas’ family had purchased the property from the previous owner’s estate. Nicholas indicated that no drums had been found, but that the heavily wooded area was being mowed to better access the property. Nicholas stated that he would report any drums found.<sup>121</sup>

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## **Fires**

Residents of Tarpon Springs were concerned about emissions from fires and spills from the plant. Although fires were reported over the years, little documentation exists. One former employee reported that two employees were burned to death and that one was blown up during the plant’s operation.<sup>122</sup>

On March 8, 1987, Kevin Horn, a boat repairer who was driving in the neighborhood, discovered a fire. Horn was enveloped by fumes which “rose in the air then sort of fell to the ground.” The fire department extinguished the blaze in 15 minutes.<sup>123</sup> The Pinellas County Air and Water Quality Division sent Stauffer a first warning notice for failure to properly maintain an air pollution source.<sup>124</sup>

In February 1995, Stauffer reported that 120,000 gallons of phosphorus, 13,000 gallons of sodium hydroxide, and 25,000 gallons of phosphoric acid were on-site in 1994.<sup>125</sup>

On September 25, 1996, Zeneca signed a memorandum of understanding with the Tarpon Springs fire department to provide assistance during the removal of phosphorus.<sup>126</sup> Subsequent to the signing, fires were reported on two occasions in 1998.<sup>127</sup> The most notable fire, however, occurred on October 15, 1996, when Stauffer attempted to move phosphorus from the site. Zeneca reported that the fire was extinguished in 10 to 15 minutes.<sup>128</sup> The fire department billed Zeneca \$7218.05 for October and November 1996, when firefighters were on stand-by status for Stauffer.<sup>129</sup>

### **Plant Operation**

In November 1947, the plant began 24-hour operations. When the electric furnace was turned on, a bit of fanfare resulted, as the glow in the night sky drew a crowd of spectators who thought a forest fire had erupted.<sup>8</sup>

During a 1949 tour of the plant by mortgage bankers and news representatives, Eldon Hill, a plant official, said that the production of phosphorus at the plant “is as much a mystery to some of the workers here as it is to outsiders.” Hill also announced that the principal ingredient extracted from phosphate at the plant is phosphoric acid. A newspaper article about the tour said that, “Local men employed at the plant consistently declared that they didn’t know what was being processed there.”<sup>130</sup>

While it sounds inconceivable that a plant could be put into operation without its staff knowing what the facility actually manufactured, this seems to have been the case at the Tarpon Springs plant. However, this lack of knowledge is understandable when it appears that even supervisors did not know a great deal more. Depositions in the 1948 Mickler lawsuit confirm that officials of the plant had limited knowledge of its operations. Under cross-examination, Crider, the plant superintendent, said,

Q: Do you know what percentage of phosphate, by analysis, the rock shipped to your plant contains?

A: No Sir.

Q: To what temperature do you subject it?

A: I don't know.

Q: Can you give us an approximation of the temperature to which the rock is subjected?

A: No. I cannot.

Q: So, if your cleansing system had not been cut on the gases and fumes will frequently escape, will they not?

A: I suppose they would.

Q: By shutting the kiln down is it possible, immediately, to stop these gases and fumes, or will the hot rock discharge the fumes right on until it cools?

A: I don't know.

Q: Is there anyone at the plant who does know this?

A: I am not sure that there is.

Q: How long does it take it (rock in the kiln) to travel through it?

A: I don't know. We have never timed it.

Q: Would you say it would take an hour or two hours?

A: I wouldn't say. I don't know.

Q: Do you know anything about the chemical contents of the gases and fumes escaping from your plant?

A: No Sir.

Q: Is there anyone at your plant who does know this?

A; No, not reliably.

Q: Please explain your answer a little more fully, and explain what you mean by reliably?

A: Well, I will say this: in any process where you are burning fuel, it is a matter of knowing how much oxygen you have got in your waste gases, or how much carbon monoxide, in order to control the combustion. As far as the operation is concerned, we people in the operation are not concerned about any content, and, therefore we do not know.

Q: Do you know what a cubic yard of the raw phosphate rock arriving at your plant will weigh?

A: No.

Q: Do you know about anybody that would know that, as a matter of fact?

A: No Sir. We would have to determine it.

Q: Do you know what a cubic yard of slag weighs?

A: Not exactly.

Q: How much phosphorus do you get from a ton of rock?

A: I would have to check operating records to give you that. I do not have the mental figure.

Q: For what purpose is it (lime) used?

A: That is used in the scrubbing process.

Q: That is in an endeavor to prevent escape of these gases and fumes?

A: Well, I suppose it is. The chemist tells us to put it in there.<sup>9</sup>

Following is the deposition of Holtgrewe, in charge of operations at the plant.

Q: Please state briefly what your duties are?

A: Well, the main duty that I have is operating the various processes at the plant, in the prescribed manner, as handed to me by Mr. Crider.

Q: Do you know what a cubic yard of this raw phosphate rock weighs?



A: Well, I could say approximately in cubic foot weight.

Q: What would that be, per cubic foot?

A: Well it will vary, somewhat, between ninety and one hundred and five pounds per cubic foot.

Q: Well, now do you know to what temperature the rock is subjected in the kiln?

A: That is a question that is pretty hard to answer. I don't know as I could give you any light on that.

Q: Could you state the percentage of phosphorus that you obtain from a ton, or cubic foot or cubic yard of rock?

A: No Sir, I could not.

Q: Could you not state it approximately?

A: No Sir. I do not know.

Q: Are other elements removed from the rock, during this heating process, besides the moisture and phosphorus?

A: I would not really know.

Q: I do not recall whether you stated how hot the furnace was, or do you know?

A: I would not know.

Q: The phosphorus itself comes out in the form of a gas, and is condensed?

A: In a technical way I could not answer your question whether it is a true gas or not. I do not know.

Q: During the drying process in the kiln do any gases escape?

A: I believe I answered that question before. I do not know.<sup>9</sup>

While it is difficult to believe that those who directed the operations of the plant in the early days knew only the most basic information regarding the plant's operation, their answers in deposition can easily cause one to question their level of knowledge.

In an attachment to an inspection report by Pinellas County Environmental Management, Air Quality Division, the basic operation of the plant was outlined as follows:

Phosphate rock was shipped to the Stauffer Chemical Company plant at Tarpon Springs in railroad cars. The first step in the process of producing elemental phosphorus was to pass the phosphate rock through a rotary kiln approximately 300 feet long where it was heated to remove certain impurities and to fuse it into lumps called "nodules," which are more suitable for the next process. These nodules were then mixed in proper proportion for a chemical reaction with coal or coke (carbon) and silica or quartz gravel. This mixture was then fed continuously through chutes into an electric furnace. This furnace was a large chamber lined with carbon blocks in the lower section. Three consumable electrodes, each more than three feet in diameter, extended through the roof of this furnace to conduct the electric current. An electric arc was formed between the electrodes and the furnace lining.

The mixture of phosphate nodules, coke, and silica was heated and eventually melts (at approximately 1400 to 1800 degrees centigrade) in the intense heat of the electric arc. At this temperature silica becomes a strong acid, which reacts with the phosphate rock (calcium phosphate) to yield a slag (calcium silicate) and the phosphorus pentoxide ( $P_2O_5$ ) a compound of phosphorus and oxygen. This compound in turn reacts with the carbon in the coke and is reduced to carbon monoxide and elemental phosphorus which is a gas at this temperature. These two gases, carbon monoxide and phosphorus, pass up through the solid mixture in the upper part of the furnace, giving up much of their heat, and are then passed through a cooling chamber and the condenser. Here the phosphorus condenses to a liquid and is separated from the carbon monoxide which remains as a gas. This phosphorus-free carbon monoxide gas is then used as a fuel to heat the nodulizing kiln.

The slag was withdrawn from the bottom of the furnace as a liquid, which is then cooled and crushed to form the familiar form of slag which is used for road building and other construction uses.

Also withdrawn from the bottom of the furnace in a liquid state is the iron compound ferrophosphorus. This was chilled in molds and is eventually used in the steel, petroleum, and other industries.

The phosphorus condenser contains a large amount of water and as the phosphorus becomes a liquid, it sinks below the water because it is heavier than water. As long as phosphorus is kept under water and out of contact with the air, it will not burn. Consequently, the phosphorus which was manufactured at Tarpon Springs was stored in a big tank under water, purified by filtering and then loaded into tank cars containing water. These tank cars transported the phosphorus to the various converting plants in Tennessee, Illinois, Pennsylvania and California.

At these converting plants, part of the phosphorus was burned in large furnaces to produce phosphoric acid. The acid is cooled by being passed through towers in which water is being sprayed, and it is withdrawn at the bottom of the towers in the form of pure liquid phosphoric acid.

The acid has many uses; such as in rustproofing of steel, electric polishing of stainless steel, refining of petroleum products, plastics industry, the manufacture of food and beverage compounds such as soft drinks, jellies, etc. Most of it, however, is converted to phosphates of calcium, sodium, ammonia, potassium, magnesium, and aluminum, which are used in foods and practically every industry that is known to modern science.

Phosphorus is also used in the manufacture of powerful insecticides, fireworks, military purposes, and other intermediates which are used by other industries.<sup>131</sup>

Flow charts of the operations are attached as exhibits 16 and 17.

Citizens of Tarpon Springs have expressed concern over the Victor/Stauffer contracts with the Department of Defense. In 1941, the Chemical Warfare Service (CWS) awarded a contract to Victor to deliver white phosphorus, a smoke and incendiary agent. Victor's Mount Pleasant, Tennessee, plant supplied Edgewood Arsenal with the material until December 1941. White phosphorus was loaded into artillery shells, mortar shells, hand grenades, rockets, explosive igniters, and bombs of various sizes.<sup>132</sup> Stauffer supplied materials to CWS in 1943.<sup>133</sup>

In its answer to the Mickler suit, Victor lists a large number of uses for the phosphates produced by the company, such as uses in foods, beverages, pharmaceuticals, plastics, and fireproofing. According to the answer, "A large portion of Victor's phosphatic products went directly to the war effort for military purposes particularly for the manufacture of transparent plastics for machine gun blisters, cockpit canopies and noses for military aircraft."<sup>3</sup>

### **Stauffer Shipments**

After the decision to close the plant was made, Stauffer sought to remove materials from the plant. On August 9, 1984, Harris signed a waste data sheet for the one-time shipment of 200 tons of phosphate-contaminated roaster fines, characterized as flammable solid. The form indicated

that the chemical composition was 20% phosphorus and 80% calcium phosphate, but did not indicate the receiving site.<sup>134</sup>

Stauffer was concerned that the materials might be classified as a “waste,” requiring the firm to meet different standards. In February 1992, Tom Tiesler, director of the Division of Solid Waste Management for the Tennessee Department of Conservation, wrote to Thomas Mirabito, of Rhône-Poulenc, one of the numerous former Stauffer parent companies, indicating that Tennessee would not consider the materials a “waste,” but that California may consider the material as waste under state rules.<sup>135</sup> The Stauffer plant in Mt. Pleasant, Tennessee, was a candidate to receive the materials left at the site.

In January 1986, efforts were made to remove materials from the clarifier at the plant, a process which was completed in July of that year.<sup>136</sup> The Pinellas County Health Department received numerous complaints about a clarifier release. During a 1987 inspection, NUS Corporation found 10 inches of sludge in the clarifier, which was removed.<sup>136</sup>

Materials were placed in railcars for shipment to other Stauffer locations. The material was not analyzed by a laboratory, and was declared by the Department of Environmental Resources to be usable material and not waste.<sup>136</sup> At least one such car reached Stauffer’s Silver Bow, Montana, plant and 17 workers were hospitalized after cleaning out a pit with phosphorus or phosphine. According to Kent Wilson, a representative of the International Chemical Workers Union, the materials were from Tarpon Springs.<sup>136</sup> One worker was “burned up” while unloading a railcar in Silver Bow.<sup>136</sup>

According to A.K. Roberts, maintenance superintendent of Stauffer’s South Gate, California, plant, 23 railcars of materials were moved to the Tennessee plant. He indicated that the waste contained phosphorus, phosphoric acid, arsenic, and possibly heavy metals.<sup>136</sup> Four of the cars were sent to the Stauffer facility in San Luis, Mexico.<sup>136</sup>

**Exhibit 16. Phosphorus Production Flow Diagram**

**Exhibit 17. Phosphorus Production Flow Diagram**

Investigators from California interviewed Don Eddlemon who had worked for Stauffer for 22 ½ years. Eddlemon called the materials *waste* saying, “this sludge was pure waste,” and stating that he knew that 150-200 drums of phosphate sludge were buried at the Tarpon Springs plant, where he worked from 1977 to 1979. He also indicated that drums were placed in the ponds at the plant.<sup>136</sup>

In an interview with police, D.T. Nelson and Leon Duffin of the South Gate plant indicated that Stauffer stopped the effort to recover wastes from the railcars because the process was not cost effective and the employees all became sick. Nelson and Duffin said that Dick Saunders, of the South Gate plant maintenance, had told them that two of the railcars were destroyed in the waste removal process and that the other cars were being moved around the country to hide them.<sup>136</sup> Each car holds about 10,000 gallons of sludge.<sup>136</sup>

Because the materials met California’s definition of waste, that state sought to prosecute Stauffer for the one railcar that reached the South Gate plant. In fact, Stauffer was charged with a felony in the Los Angeles County Superior Court. On November 20, 1992, Stauffer plead *nolo contendere* (no contest) to one count. The firm was found guilty, sentenced to 3 years probation and required to restitution and fines totaling \$675,000. Stauffer then asked the court to reduce the felony to a misdemeanor, and with concurrence of the state, the charge was reduced to that lower level, which is permissible under California law.<sup>137</sup>

Crude phosphorus was also removed from the site in 1997. Shortly after the operation began, a fire occurred, halting the removal. A tent was erected under which the removal could occur in more controlled conditions. EPA conditionally approved the removal implementation plan. On June 10, 1997, McNeice sent an addendum to the plan to EPA Region IV.<sup>138</sup>

In 1999, Stauffer began preparations to remove 20,000 gallons of dilute phosphoric acid from the site. On August 17, 1999, John Goddard, Zeneca’s chief financial officer, sent a letter of

certification to the Pinellas County Health Department, providing assurances that the firm was financially capable of covering expenses related to the transportation of the chemical.<sup>139</sup>

On October 6, 1999, EPA sent Stauffer EPA Notice No: 572/99, acknowledging receipt of a notice of intent (dated September 17, 1999) to export **hazardous waste** to Canada (emphasis added). The letter described the waste as 30,000 gallons of phosphoric acid, EPA Waste Code: D002, D005, D007, D008, D010.<sup>140</sup> From this letter, it appears that Stauffer told EPA that the material was hazardous waste. On November 5, 1999, 3 days before the removal, Stauffer sent out a press release, informing the public of the materials being transported.<sup>141</sup>

### **Yellow Cake Production**

On January 27, 1987, Jack Lawson, of the *Clearwater Sun*, wrote a story entitled “Uranium was extracted at Stauffer plant,” indicating that in the 1970s, Stauffer let another company extract and recover the small amounts of uranium remaining in processed ore at the plant.<sup>142</sup> Such extracted uranium, commonly called yellow cake, can be used in the powering of power plants or in the production of nuclear bombs.

The ombudsman spoke to Lawson twice. The journalist stands by the story and has an amazing recollection of the related details. His story was based upon two sources, McCall, a public health officer for FDHRS<sup>142</sup> and Fred Thompson, with the State Department of Transportation (DOT).<sup>143</sup> McCall was said to have been in charge of inspecting potential radiation hazard, at the county level, if the hazard source was exempt from coverage by the Nuclear Regulatory Commission.

According to the story, McCall stated that, “They formed a separate company and built alongside Stauffer. They even put up a few separate buildings.” The operation was said to have occurred between 1975 and 1980. McCall indicated that he could not remember the name of the new firm. He also indicated that the removal of traces of uranium was good for the public health.<sup>142</sup>



However, McCall recanted the story the next day. Lawson indicated that in addition to the story being recanted, executives of Chesebrough-Ponds, the company that owned the site at the time of the story, descended upon the *Clearwater Sun*, seeking a retraction. However, the editor refused to retract the story because of two corroborating sources. There are rumors that McCall was forced to recant the story out of fear of losing his job and/or his retirement benefits. On August 2, 2000, McCall told the ombudsman, in a non-committal way, “I have no memory of it, I don’t think it was done.”<sup>143</sup>

The ombudsman made numerous attempts to locate and interview Thompson. There were 27 phone listings for “Fred Thompson” in Florida. Of those contacted, none had ever worked for DOT. For those not reached, messages were left on two occasions, asking the receiver to call a toll free number if they were a former DOT employee. No one returned the call.

#### **Department of Energy Plant, Largo, FL**

The ombudsman received information indicating a likely reason for any attempt to process yellow cake would be for use at the Department of Energy (DOE) plant in nearby Largo, Florida. The public in the area knew little about the DOE plant and assumed that nuclear devices were assembled there.

Lawson told the ombudsman that the DOE facility was very secure and was unofficially known as the “bomb factory.” He also indicated that the *New York Times* had written an article about the facility in 1987, 1988 or 1989, and that the *Clearwater Sun* had written about 20 articles concerning the facility.<sup>144</sup>

In an attempt to confirm or deny the report of a contractual link between the Stauffer plant and the DOE plant, a number of individuals were contacted. Below is a summary of the conversations:

**Eric Nuzie, federal facilities coordinator for the Florida Department of Environmental Protection (FDEP):**

- To the best of my knowledge, the plant manufactured triggers for nuclear devices.
- I am not aware of any relationship between the sites.
- The DOE plant closed about five years ago.
- A cleanup of the site is underway.
- Only small levels of radioactive materials were present at the plant.<sup>145</sup>

**John Armstrong, FDEP, remedial project manager for the site cleanup:**

- Not aware of any relationship between the sites/plants.
- Relatively sure the story of a link is untrue.
- The plant never had anything worse than tritium, for calibration.<sup>146</sup>

**Carl Frode, former remedial project manager, EPA Region IV, Federal Facilities Branch:**

- Based upon my knowledge of what the plant did, I would find that [the allegation] amazing.
- I have no knowledge [of the link], based upon my 3 years of working on the site.<sup>147</sup>

**Dave Ingle, presently the only remaining DOE employee at the site, works on the site cleanup and advises the city:**

- I don't know of any link between the plants.
- I don't know how DOE-Largo would use the materials [yellow cake].<sup>148</sup>

**Blaine LeCouris, former police chief of Tarpon Springs, said to have been aware of activities at the Stauffer plant:**

- I have no knowledge about it, I don't remember it.
- I will check with others at the Old Timers meeting and get back with you if someone remembers it.<sup>149</sup>

**Jim Robins, contract representative, DOE-Albuquerque, New Mexico:**

- They made batteries for weapons and satellites-electrical components.
- I can't imagine any relationship.<sup>150</sup>

**Damion DeRoeber, Lockheed Martin (the contract operator of the plant when it closed):**

- There was never a reason for that [yellow cake] to be in the building.
- I am not aware of any need for yellow cake.<sup>151</sup>

After the investigation, no conclusion can be drawn regarding attempts to extract uranium. Having depended upon two sources, it is reasonable that a reporter would write the story. It can be noted that the one source located did not say that the extraction did not occur only that he did not think yellow cake was processed. The second source, Fred Thompson, could not be located.

Additionally, an information request to Stauffer, pursuant to Section 104(e) of the Comprehensive Environmental Response, Compensation, and Liability Act, could provide additional information regarding any possible attempts to extract uranium.

It is unlikely that if yellow cake was extracted, the materials found a new home at the DOE Largo plant. From those interviewed, it appears that the activities of the facility did not require the use of yellow cake.

The processing of yellow cake was not confirmed, and it can be noted that neither the Stauffer plant nor the DOE-Largo facility were listed among the 564 sites released by DOE which might have secretly processed radioactive and toxic materials during the cold war.<sup>152</sup> (Stauffer's Metals facility in Richmond, California, was listed.)

### **Military Exercises**

Another mystery surrounding the plant deals with the military exercises conducted on-site. Numerous citizens have mentioned the exercises, and two wrote about the activity. In July 1996, Jane Ross Hammer, wrote the following to commissioner Charles Rainey, of the Pinellas County Board of Commissioners, seeking information on the exercises:

My question to you and the Board of Commissioners is: What have you done for Pinellas County about training exercises militarists have held, not just recently (see my report to Fred Marquis) but for years, according to citizens, on the site of the closed Stauffer Chemical Co?<sup>153</sup>

Mary Mosley said the exercises went on for years after Stauffer closed. Jeeps and covered trucks were driven by men in camouflage gear.<sup>154</sup> She also indicated that no information was ever provided to the citizens regarding the activities.

### **Equifax**

Recently, state and federal officials have been looking into employee health in a building occupied by Equifax, at 11601 Roosevelt Boulevard in Pinellas County. At least 12 of the more

than 2,000 employees who work in the building have reported mysterious hair loss. There are allegations that at least four women are now totally bald and must wear wigs. Thallium, which can cause hair loss at levels exceeding the state's permissive levels, has been found in groundwater samples on at least two occasions.<sup>155</sup>

OSHA has begun to investigate whether these health problems could be caused by the nearby Toytown landfill or the activities of the building's former occupant, Honeywell's military avionics division. The building is 250 feet from the landfill. William Kutash, of FDEP's Waste Management Division said, "Thallium rarely shows up as a contaminant in groundwater." While FDEP officials have not pinpointed the source of the contaminant, local residents are concerned that the contaminant may have migrated from the Stauffer site, some 4 miles away.<sup>155</sup> Others question whether fill material from Stauffer may have been placed in the landfill.

More recent tests have shown no sign of thallium in the building or in filtered groundwater.<sup>156</sup> However, since the problems at the building were first reported, more than 90 persons have called OSHA to report ailments. Most are employees of Equifax, but some have been workers at nearby Danka and Lucent Technologies. One Equifax employee faxed OSHA a listing of 38 persons who may have been affected, which raised the number of complaints to more than 120.<sup>156</sup>

Equifax has set aside \$200,000 for medical tests of employees and has interviewed 69 employees regarding health problems.<sup>157</sup>

## **Chapter 5: Partnership Cooperation and Documents Issued**

### **Partnership Cooperation Between FDOH and the ATSDR Ombudsman**

#### ***FDOH is Cooperative***

Early in the ombudsman investigation, the Florida Department of Health (FDOH), Bureau of Environmental Toxicology, was very cooperative. The ombudsman first requested all reference materials considered in the development of health assessment and consultations for the Stauffer site. FDOH gave the ombudsman the material, which filled two 3-inch binder notebooks.

#### ***FDOH Resists Cooperation***

However, FDOH's overly cooperative nature was sharply curtailed after April 12, 2000.<sup>158</sup> On that day, the ombudsman e-mailed FDOH requesting copies of responses they received from former Stauffer workers after the agency had sent out the worker safety announcement in 1996. Randy Merchant, environmental administrator of FDOH, e-mailed back, asking for a formal request.<sup>159</sup> On April 17, 2000, the ombudsman complied,<sup>160</sup> and the formal request was acknowledged by e-mail on April 26, 2000.<sup>161</sup>

In a May 5, 2000 memorandum, Merchant sought legal advice from Amy Jones, deputy general counsel in the Office of the General Counsel (OGC), regarding the release of the requested information, and suggested the following five possible responses:<sup>162</sup>

1. Deny Mr. Wilson's request based on the Chapter 405, F.S., exemption from public records requirements.
2. Invite Mr. Wilson to travel to Tallahassee to view the records in person.
3. Send Mr. Wilson copies of the requested documents without personal identifiers.
4. Send Mr. Wilson unmodified copies of the requested documents after reviewing federal privacy statutes to insure they provide as much or more privacy protection than Florida law.
5. Send Mr. Wilson unmodified copies of the documents as requested.

The memorandum did not recommend or suggest a best course of action, or inform Jones that versions of most of the requested materials had already been provided to citizens (who had themselves given copies of the materials to the ombudsman). In a June 26, 2000 memorandum, Jones told Merchant that: “In response to your memorandum of May 5, 2000, please be advised that we may only give the information out in summary form pursuant to Chapter 405, Florida Statutes. The Department is not authorized to give it to anyone else without patient consent.”<sup>163</sup> Thus, OGC determined that the ombudsman should not receive materials which had already been released to the public.

### ***The Ombudsman Seeks Legal Advice***

In response to OGC’s decision, the ombudsman consulted ATSDR’s legal counsel and began preparing a request pursuant to Section 104(e) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). In the end, OGC agreed to release the documents. In a September 27, 2000 telephone conversation, Merchant told the ombudsman that the documents would be sent without identifying information, and assured the ombudsman that only identifying materials would be removed.

### ***Program Announcement 607***

ATSDR distributes funds to partner states to assist in developing health materials via Program Announcement 607. In the instance of FDOH’s Bureau of Environmental Toxicology, ATSDR provides 100% of the funding for that bureau.

It now appears that Florida, including OGC, has considered medical information gathered with ATSDR funding (and on behalf of the agency) to be exempt from disclosure, even to ATSDR, its sole funding source. It is essential that any future program announcement dictate that medical data and/or other documents obtained through the expenditure of ATSDR funding, shall be released to ATSDR upon request. One way to correct this potential void is to alter Program Announcement 607, or any subsequent funding mechanism. Section B. Recipient Optional Activities, reads as follows:

3. The recipient is required to provide proof by citing a State code or regulation or other State pronouncement under authority of law, that medical information obtained pursuant to the agreement will be protected from disclosure, when the consent of the individual to release identifying information is not obtained.<sup>164</sup>

If the document is to bear the ATSDR logo, any state program preparing a public health assessment, health consultation, or other such document described by Program Announcement 607 must forward the document to ATSDR for final approval. ATSDR may not approve the proposed document, but rather may elect to prepare and release a modified or different document. In fact, in at least one case the state document was of poor quality and ATSDR assumed the responsibility for a rewrite and release (a document not approved by ATSDR may be released under state authority, without the ATSDR logo).

Nothing in the current Program Announcement 607 specifically requires the state to provide ATSDR with copies of the materials used to develop the state's product. While ATSDR assumed that a partner state would be cooperative and provide documents and materials it has gathered, no specific requirement exists. Therefore it is possible that ATSDR could be required to duplicate costs to acquire site related data which was gathered by a state and is in the state's possession, if ATSDR elected to release a document different from the materials prepared by the state.

It could be construed that Section C. Other Activities, No. 5, covers such a request. The item, reads, "5. Respond to ATSDR's requests concerning congressional inquiries/ testimonies, program evaluation, or other information in carrying out the purpose of the project." However, such language is extremely vague and ambiguous, and does not ensure a complete turnover of materials. Therefore, stronger language concerning the production of materials, short of a letter under 104(e) of CERCLA and Superfund Amendments and Reauthorization Act (SARA), must be included in future announcements.<sup>164</sup>

Following are the general requirements for data access that apply to cooperative agreements, based upon 45 Code of Federal Regulations 92.

## **Section 92.42 Retention and access requirements for records**

### *(a) Applicability*

(1) This Section applies to all financial and programmatic records, supporting documents, statistical records, and other records of grantees or subgrantees which are: (i) Required to be maintained by the terms of this part, program regulations or the grant agreement, or (ii) Otherwise reasonably considered as pertinent to program regulations or the grant agreement.

### *(e) Access to Records*

(1) Records of grantees and subgrantees. The awarding agency and the Comptroller General of the United States, or any of their authorized representatives, shall have the right of access to any pertinent books, documents, papers, or other records of grantees and subgrantees which are pertinent to the grant, in order to make audits, examinations, excerpts, and transcripts.

(2) Expiration of right of access. The right of access in this section must not be limited to the required retention period but shall last as long as the records are retained.

## **Section 92.43 Enforcement**

### *(a) Remedies for non-compliance*

If a grantee or subgrantee materially fails to comply with any term of an award, whether stated in a Federal statute or regulation, an assurance, in a State plan or application, a notice of award, or elsewhere, the awarding agency may take one or more of the following actions, as appropriate in the circumstances:

- (1) Temporarily withhold cash payments ending correction of the deficiency by the grantee or subgrantee or more severe enforcement action by the awarding agency,
- (2) Disallow (that is, deny both use of funds and matching credit for) all or part of the cost of the activity or action not in compliance,
- (3) Wholly or partly suspend or terminate the current award for the grantee's or subgrantee's program.
- (4) Withhold further awards for the program, or
- (5) Take other remedies that be legally available.

While these requirements may apply, they are not expressly noted in the cooperative agreement and in fact they require protracted actions to enforce. Placement of these words, or a reference to them, within the context of the cooperative agreement would be more forceful and have a greater impact.

### ***Considerations for the Future***

Legal questions arise regarding the records created or developed by state partners while funded by cooperative agreements from ATSDR, such as:



- Do these documents belong to ATSDR?
- Is the state partner a contractor or a ‘quasi’ contractor?
- If ATSDR elected to use a contractor to produce health assessment documents, the materials gathered would likely become the property of ATSDR. Therefore, shouldn’t materials gathered by the state partners, under cooperative agreement funding become property of the agency as well?

When federal monies are expended, there should be, and must be, a means of accessing not only the product of the expenditure, but also the materials that were used in the production of the final document. ATSDR management should assure citizens of the United States that every effort has been taken to avoid the unnecessary duplication of expenses.

If ATSDR is to avoid potential pitfalls in the use and distribution of federal monies, present and future program announcements should be altered to ensure that the agency can request and receive site related data/materials from partner states.

The Office of Program Operations and Management (OPOM) at ATSDR told the ombudsman that, “we cannot require a grant of cooperative agreement recipient to give us anything.”<sup>165</sup> However, a review of the statutory law states otherwise. 42 U.S.C Section 9604 (d) states the following:

*(d) Contracts or cooperative agreements by President with States or political subdivisions or Indian tribes; State applications, terms and conditions; reimbursements; cost-sharing provisions; enforcement requirements and procedures*

(1) Cooperative agreements

(A) State application

A State or political subdivision thereof or Indian tribe may apply to the President to carry out actions authorized in this Section. If the President determines that the State or political subdivision or Indian tribe has the capability to carry out any or all of such actions in accordance with the criteria and priorities established pursuant to section 9605(a)(8) of this title and to carry out related enforcement actions, the President may enter into a contract or cooperative agreement with the State or political subdivision or Indian tribe to

carry out such actions. The President shall determine regarding such application within 90 days after the President receives the application.

(B) Terms and conditions

A contract or cooperative agreement under this paragraph shall be subject to such terms and conditions as the President may prescribe. The contract or cooperative agreement may cover a specific facility or specific facilities.<sup>166</sup>

The statute provides more than just the ability to create specific terms and conditions of the contract or cooperative agreement, it also provides authority to recover funds if the contractor or recipient of the cooperative agreement fails to comply with the standards or requirements of the agreement. Section (d)(2) reads as follows,

(2) If the President enters into a cost-sharing agreement pursuant to subsection (C) of this section or a contract or cooperative agreement pursuant to this subsection, and the State or political subdivision thereof fails to comply with any requirements of the contract, the President may, after providing sixty days notice, seek in the appropriate Federal district court to enforce the contract or recover any funds advanced or any costs incurred because of the breach of the contract by the State or subdivision.

At present, ATSDR does not use 42 U.S.C Section 9604(d) as the authority for cooperative agreements. Instead, ATSDR uses Section 9604 (i)(15) which reads,

(15) The activities of the Administrator of ATSDR described in this subsection and section 9611(c)(4) of this title shall be carried out by the Administrator of ATSDR, either directly or through cooperative agreements with States (or political subdivisions thereof) which the Administrator of ATSDR determines are capable of carrying out such activities. Such activities shall include provision of consultations on health information, the conduct of health assessments, including those required under section 3019(b) of the Solid Waste Disposal Act (42 U.S.C.A. 6939a[b]), health studies, registries and health surveillance.

ATSDR uses cooperative agreements because they are more flexible and allow the agency to provide assistance to the partner states. Although the idea being expressed by the agency is that we are “assisting” the states, the reality is that ATSDR funds state partners to advance the number of health activities conducted annually, since the agency is limited in the number of full-time employees it may hire. In principle, ATSDR is providing some assistance to the states but the real purpose of cooperative agreements is to expand the agency’s ability to conduct public

health assessments, health consultations, and public health education. If assistance is the real purpose, ATSDR should say so. If however, the real purpose of cooperative agreements is to expand ATSDR's capabilities to fulfill its mandate, it is time to make such an admission. After the determination is made, ATSDR will then be able to decide the appropriate tool and/or requirements to place into effect.

David Ayers, OPOM's deputy director, sent the following e-mail to Peter McCumiskey, ATSDR's deputy assistant administrator:

The main difference between a grant and a cooperative agreement is our level of involvement. Basically, we give the money under a grant and we ASSIST under a cooperative agreement. In either case the effort is a collaborative one with the money being used by the recipient organization on THEIR project which also furthers our mission. If we are looking for a product or service which serves our need then we need to acquire it under a contract.<sup>167</sup>

While a different level of involvement may arise from the use of cooperative agreements to expand ATSDR's ability to function via state partners, the ultimate responsibilities for ATSDR cannot be delegated. The axiom, "You can delegate authority, but you can't delegate responsibility," is true in this matter. ATSDR has been given responsibilities by statute and if the use of state partners to fulfill these obligations is effective, everyone is happy. However, when the use of state partners becomes a problem or a potential problem is recognized, it is time to take action to ensure that the public's health and welfare are secured. As presently used, state partnerships, via Program Announcement 607, pose many problems, and include the need to:

- Ensure public participation and input into the processes.
- Ensure that ATSDR has access, and even ownership, of materials gathered for and considered in the public health assessment process; this would prevent or greatly reduce the likelihood that federal monies are spent twice to gather important data for health assessment or education.
- Control the ATSDR logo to ensure that its appearance does constitute agreement or endorsement of the product by the agency.

- Create quality standards for the development and distribution of health assessment and education.
- Hold those who spend federal monies to accountable standards of performance.

The statute clearly provides the authority to develop the requirements necessary to create a workable contract or cooperative agreement program which would enable ATSDR to extent its capabilities with quality standards and preserve the agency's access to data.

### **Documents Issued by All Parties Involved**

#### ***FDOH Disregards Input of Citizens***

The State of Florida appears to consider the input from local citizens to be unimportant or irrelevant to the production of materials related to the site. Often the materials (or contents thereof) produced by the state are duplicated by EPA, ATSDR, and/or the responsible party and are assumed to be accurate.

Community members have attended numerous meetings, made phone calls, and provided written information to the state in an attempt to correct the data the state is using to reach its conclusions. However, this effort has had little effect, and it appears that only the responsible party has been able to effectively impact materials for public release.

#### ***Citizens Are Concerned About FDOH's Handling of Data***

One measure of concern is the way writers handle a static number, like the census data. For example, the number of residents from the 1990 census and the number of wells within 1 mile of the site vary greatly, from 3,200 to 18,700 people, and from zero to 230 wells, depending on which document is read. As the public has pointed out, if the handling of a number that doesn't change is problematic, how will FDOH handle dynamic numbers? The public has a legitimate right to question the manner in which these census numbers have been handled, and may wonder if the authors are as imprecise about the numbers affecting lives as they are about static numbers?

The discrepancy in figures may be a minor issue, but it nevertheless reflects the need to gather accurate data. While the same census database can generate different numbers, based upon the definition of the site (whether one considers the plant or the school) and the distance (the difference between measuring within 1 mile of the borders of the site, or measuring within a 1-mile radius from the center of the site), the discrepancy in numbers here is still too great. Knowing the correct number of people is critical because the health assessment program is attempting to determine health impacts of contaminants. Likewise, the number of wells is of critical importance in the development of a protocol or strategy to determine where the wells are, their uses and usage, and whether they are contaminated.

Table 10 illustrates the discrepancy in reporting the 1990 census numbers.

**Table 10. 1990 Census Data Numbers as Reported in Various Documents\***

<b>Document</b>	<b>Number of People</b>	<b>Number of Wells</b>
08/1993 preliminary public health assessment	- 14,000 within a 1-mile radius of the site north of the Anclote River, and - 4,700 within one mile south of the river	At least five private wells and three public wells
01/1994 health consultation	—	No potable wells
12/1995 health consultation	14,000 within 1 mile of the site	—
07/1998 health consultation	3,200 within 1 mile of the school	100 private wells
08/1999 addendum to the preliminary public health assessment	9,231 within a 1-mile radius of the site	100 private wells
08/1999 health consultation	9,500 within 1 mile of the site	230 private wells
10/2000 GATHER database	9,283 within 1 mile of the site	—

\*See Chapter 3 for more details on each document.

The public has also questioned the science used to develop the 1993 preliminary public health assessment (PHA). The ombudsman spoke with Allen Susten, Ph.D., assistant director of Science for ATSDR’s Division of Health Assessment and Consultations, who said, “I’ve looked at this

and the science is good.” Others have indicated that the science is good, or that the author is known for using good science. Not being a scientist, the ombudsman has to accept the opinions of those better suited to make such determinations.

### ***FDOH Ignores Data***

After speaking with Susten, the ombudsman located many documents that were available to the writer of the 1993 preliminary PHA, but were not considered. In June 13, 2000, Bruce Tuovila, formerly with FDOH, told the ombudsman that he did not contact the Pinellas County or Pasco County Air and Water Quality Division staff, nor did he contact the City of Tarpon Springs, to gather input or data for consideration. He indicated, however, that he spoke with Ken Swan, of the Pasco County Health Department and the Engineering Office of the Pinellas County Health Department.<sup>168</sup>

The ombudsman and Carl Blair, ATSDR’s Region IV representative, visited the Florida Department of Environmental Regulation (FDER) and found volumes of information within the files that had not been considered in the PHA. This office was less than 1 mile from the FDOH office. At the Pinellas County Department of Environmental Quality, Air Quality Division, another large cache of information was located that should have been considered, including air emissions data.

### ***Problems with the 1993 Preliminary PHA***

The past, and its impact on the community, was never considered in the preliminary PHA. Tuovila indicated that he “assumed that contamination found had been there historically, or as far back as workers were there and exposed.” While the contamination was considered historical, no effort was made to determine the health impacts the historical contamination had, was having, and would have on the public. The preliminary PHA sought only to capture prospective health impacts.

When the PHA was prepared Tuovila stated he was aware that “A second assessment would have to be done,” and indicated that “Escambia Wood impacted this assessment, and our going through the steps of a PHA.”<sup>168</sup> Escambia Wood is another National Priorities List site in Florida, which has been the scene of high-stake political battles. EPA began moving residents from around the site in 1997, and when completed, more than 300 families will have been relocated.

Tuovila indicated that he wrote the preliminary PHA using the preliminary assessment/site investigation from EPA, a site visit he conducted, and meetings or conversations with Jane Hammer and Mary Mosley. References pertaining to the PHA fill two 3-inch binders, so a volume of information was relied upon in preparing the document. However, as mentioned earlier, much more data were available, some within close proximity to his office.

Another cause of concern with the findings of the 1993 preliminary PHA is the location from which the background samples were taken. Soil, sub-surface soil, shallow groundwater and deep groundwater background on-site samples were taken from the northeast corner of the site. The sediment background sample was taken from the eastern half of the slag disposal area. While these samples were taken from the most undisturbed area of the site, the area was well within the distance contaminants (i.e., dust, asbestos, phosphorus pentoxide, sulfur dioxide, and others) could have easily traveled.<sup>4</sup>

Few background samples were collected to measure off-site contamination. No samples were taken for surface soils, sub-surface soils, deep groundwater, or shallow groundwater. One surface water sample was taken upstream from the site. A sediment background sample was taken just off the site and one sample from several miles away.<sup>4</sup>

Notwithstanding the finding that the site is a public health hazard, one can only question what the finding(s) might have been if appropriate off-site background samples had been used for comparison. Background samples from an area distant enough not to have been affected by the plant should be the basis upon which comparisons are made.

In its letter seeking ombudsman involvement, Pi-Pa-Tag, Inc., a not-for-profit citizens group, offered the following comments on the 1993 preliminary PHA,

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#### **August 1993 Public Health Assessment**

In 1993, FDOH (then known as FDHRS) issued a Public Health Assessment for Stauffer Chemical Company, Tarpon Springs Plant, in Pinellas County, Florida. Because contaminants were detected both on- and off-site, in soil, groundwater and surface water, the site was classified as a public health hazard. The report stated that contaminants “may appear in private wells south and west of the site in the future.”

A number of site characterization recommendations were made for additional testing and monitoring. Some of these have been carried out, although a number of them have not. A public education program was also recommended. Specifically:(1) area residents who obtain their drinking water from private wells (which are not tested regularly) were to be informed of the possibility of both current and future contamination of their wells; and (2) a general health education program should be conducted to help community members and on-site workers understand their potential exposure to contaminants, and the possible health risks involved.

Under CERCLA, ATSDR's Health Activities Recommendation Panel (HARP) evaluated the data in this Public Health Assessment and determined that the following actions were needed at the site:

- Local residents and site workers are being exposed to contaminants, and Health Education is needed to help them understand their potential for exposure and health risks, and explain measures they can take to reduce their exposure.
- Health Professional Education is needed inform the local medical community about health effects that may occur.
- A health statistics review for cancer rates in the area needs to be done.

In light of the recommendations both in the PHA and from HARP, a Public Health Action Plan was drawn up:

1. **Well Monitoring** - The Pinellas County Public Health Unit (PCPHU) would monitor private wells near the site to detect increases in contaminants already found or the appearance of new ones.
2. **Public Education** - FDHRS (now FDOH) would develop educational materials to inform residents who may be consuming contaminated water from private wells of the possible danger. These materials were to be distributed by FDHRS, with the



assistance of the PCPHU, which would also provide consultation to affected residents.

3. **Physician Education** - FDHRS would develop a physician education program to inform local doctors of the possibility that their patients may exhibit adverse health effects resulting from exposure to contaminants from the Stauffer Site.
4. **ATSDR Oversight** - It was further stated that ATSDR would provide guidance and assistance to FDHRS in the development of the above-mentioned educational material.

### **1993 PHA Public Action Plan Never Carried Out**

Three years later, in March 1996, in response to questions from the Governor's Commission on Environmental Justice and Equity, pertaining to the status of activities resulting from the 1993 PHA, it became clear that, for the most part, the Public Health Action Plan had never been carried out.

There is evidence to show that the PCPHU had not even received an official copy of the final PHA for the Stauffer Chemical Superfund site until that time.

In an April 5, 1996 letter to FDHRS, the PCPHU acknowledged receipt of a copy of the PHA in March 1996, and indicated that, while some periodic sampling of private wells had been carried out, "the PCPHU most probably has not met the full intent of the criteria outlined." The letter went on to state that they were unaware of any educational materials produced by FDHRS to be distributed by the PCPHU staff. PCPHU conceded that they had not met the Action Plan developed for the Stauffer Site.

On May 20, 1996, Pi-Pa-Tag requested information from FDHRS as to their progress with the private well monitoring and the education plans called for in the Public Health Action Plan.

On June 3, 1996, Pi-Pa-Tag was informed by FDHRS that the PCPHU had been monitoring private wells in the area of the site since March of 1993. We were told that, since the PCPHU was not required to report their activities to FDHRS, we should direct our requests for information to them. There was no mention of the correspondence that had *already revealed* that the PCPHU had not met the Action Plan developed for the site.

This June 3, 1996 letter to Pi-Pa-Tag went on to state that there was one private well at a local mobile home park that had been found to contain an elevated arsenic level, and that educational flyers explaining the situation had been given to the park manager. Based on the interchange of correspondence between the PCPHU and FDHRS, it seems apparent that the entire public education program consisted solely of giving flyers to the manager of this one mobile home park.

The June 3, 1996 letter to Pi-Pa-Tag also indicated that in July 1995, a letter was sent to 26 area physicians, informing them of the procedure to request information on the site. However, only two physicians were reported to have responded. Thus, based on the aforementioned exchange of correspondence, the recommended professional education appears to have consisted of supplying two physicians with information.

Even in the most charitable interpretation of the work performed to carry out the directives of the PHA of August 4, 1993, no meaningful protection of the public or of the environment ensued. The only benefit accrued to the Potentially Responsible Party, is that the inaction of FDHRS shielded them from public knowledge of the actual problems that were revealed in the results of the tests on which the PHA Report was based.

In a phone call with Pi-Pa-Tag's Secretary on April 7, 1997, Bruce Tuovila (at that time a staff member of the Department of Environmental Toxicology, FDHRS) indicated that the agency had no direct way of communicating with the public. He indicated he would at least make sure the local libraries had copies of already available information. Again, he referred us to the PCPHU.

Also on April 7, 1997, in a phone conversation with Wayne Wyatt (while discussing the potential problem of residents using shallow wells for drinking water or filling small children's pools with water from shallow irrigation wells), Pi-Pa-Tag's Secretary was told that PCPHU did not have the authority or the funding to print up educational material explaining proper water usage. He referred us back to FDHRS.

On June 10, 1997, FDOH (formerly FDHRS) hired Dr. Christopher Teaf to conduct an educational session at Helen Ellis Memorial Hospital Grand Rounds. Several members of Pi-Pa-Tag's Board were present. While information on arsenic, asbestos, phosphorus and ionizing radiation was provided, the potential impact of living near or working at the Stauffer Chemical Company was neither explored nor stressed. Pi-Pa-Tag has since learned that, only one month later, Dr. Teaf was hired by Stauffer Management Company as a consultant.<sup>1</sup>

In direct response to the claims made by Pi-Pa-Tag, Merchant, the environmental administrator of FDOH, wrote the following comments to the ombudsman:

#### **1993 PHA Public Health Action Plan**

Ms. Malinowski is concerned with the public health action plan contained in the 1993 public health assessment report. This action plan has been carried out:

1. **Private Well Monitoring** – The FDOH depends on county health departments to monitor private wells. In April 1999, the Pinellas County Health Department collected water samples from six private wells near the Stauffer site. In an August

1999 health consultation report, FDOH found that ingestion of water from these wells is unlikely to cause illness.

2. **Educational Materials** – In September 1993, FDOH prepared an educational fact sheet for residents of the Anclote River Mobile Home Park. Since this was the only population known to be at risk from contaminated ground water, this was the target audience for educational materials.

If someone had used water from this mobile home park's irrigation well over their lifetime for drinking, cooking, or bathing, the levels of arsenic could have increased the risk of skin cancer. There was no indication that water from this well had ever been used for drinking, cooking, or bathing. On October 22, 1993, the Pinellas County Health Department delivered copies of the fact sheet to park manager Norman K. Schied who then distributed them to each mobile home. Mr. Schied indicated that the irrigation well had been out-of-service since 1988.

3. **Physician Education** – FDOH has provided information about contamination on the Stauffer site to area physicians but their interest has been limited. In July 1995, FDOH mailed information to 26 area physicians. Only two responded. In June 1997, FDOH sponsored a physician education presentation by Dr. Chris Teaf at the Helen Ellis Memorial Regional Medical Center. Only eight physicians attended. In the fall of 1997, FDOH mailed information to 500 area physicians. Only 12 responded. In 1999, FDOH offered physician education presentations to both the North Bay Medical Center and the Helen Ellis Memorial Regional Medical Center. Both hospitals declined this offer for additional physician education.

Ms. Malinowski implies that Dr. Chris Teaf's June 1997 presentation at the Helen Ellis Hospital was biased. FDOH routinely uses independent experts to train and educate healthcare providers near hazardous waste sites. Dr. Teaf, of the Florida State University Center for Biomedical and Toxicological Research, is a highly regarded toxicologist whom FDOH has used for many years. His 1997 presentation at the Helen Ellis Hospital was based on FDOH's 1993 public health assessment report. Two months after his presentation, Dr. Teaf informed FDOH that he was taking on Stauffer as one of his clients. In order to avoid any conflict of interest, FDOH decided not to use Dr. Teaf for any more presentations at this site.<sup>169</sup>

The ombudsman has confirmed that a final copy of the 1993 preliminary PHA was not provided to PCPHU until March 28, 1996. PCPHU was one of the health departments named in the preliminary PHA as being responsible for monitoring private wells in the area. In his letter, Bruce Tuovila apologized for the oversight.<sup>170</sup>

### ***Problems with Dr. Teaf's Presentation Materials***

Public health materials produced by FDOH in the public education project have met with major controversy. The presentation materials used by Dr. Chris Teaf for the grand rounds look reasonably sufficient. However, how the materials were used cannot be judged without having attended the presentation. Members of the public and public interest groups were not happy with the presentation and felt that potential public health problems were not highlighted. Mosley, who attended the meeting wrote that,

FDOH hired Dr. Teaf allegedly to assist doctors of the Helen Ellis Hospital in Tarpon Springs to diagnose symptoms of disease for patients who were former workers at the chemical plant. Instead, Teaf blatantly downplayed the harmful effects of the chemical plant and offered almost no valid information.

A pass out authored by Teaf regarding Stauffer was deliberately withheld from members of the community who attended the meeting. Soon after the meeting we learned that Dr. Teaf went to work as a consultant for Stauffer. This is a serious conflict of interest and FDOH may have determined this before the meeting.<sup>171</sup>

### ***Problems with the Worker Safety Announcement***

A major controversial public education effort by FDOH was a worker safety announcement (also referred to as public information update, flyer, or fact sheet) produced in 1996, which summarized health assessment and consultations and sought to update the community on site activities. FDOH accepted Stauffer's offer to distribute the document to the community through newspaper inserts. Pi-Pa-Tag found problems with the document, called it misinformation, and wrote the following:

In 1996, a Public Information Update with a Letterhead/Masthead attributing the document to both ATSDR and FDOH was widely distributed as an insert in a local newspaper. The document contained flagrant untruths and misinformation, minimizing the impact of the contaminants from the Stauffer Chemical Superfund Site, even making the statement that, "There are no chemicals from the Stauffer plant off the site," which was clearly contrary to the data presented in the 1993 PHA. It has been verified that the printing and distribution of this "educational flyer" from ATSDR/FDOH was paid for by Stauffer Management Company.

The Public Information document's gross misrepresentation of facts actually presented in the 1993 PHA convinced many people in the community that FDOH, either through gross

negligence or deliberate complicity with the polluter, was incapable or unwilling to provide the well monitoring and public professional education called for in the original Public Health Action Plan.<sup>1</sup>

Mary Mosley wrote the following, concerning the worker safety announcement:

It is a terrible waste of taxpayer's dollars and a conflict of interest for FDOH to author a flyer for private enterprise as they did for Stauffer Chemical Company. Taxpayer dollars were used to draft and put together a flyer which was then distributed by Stauffer.

In September 1997, FDOH composed a two-page flyer containing two pages of errors which greatly enhanced the polluter. When the errors were pointed out to FDOH in a letter and during a conference call, Merchant and Tuovila repeatedly claimed that the general public were not very well informed and would not be able to discern the mistakes. Both men refused to accept that the agency should not knowingly provide misinformation to the public and refused to correct the mistakes. After composing the flyer, the flyer was given to Stauffer Chemical Company who then mass-mailed the flyer to the community twice. Stauffer also had the error-filled flyer widely distributed by the *St. Petersburg Times* twice. Tuovila's position that it is okay to provide inaccurate information to the public was used in reverse to withhold public information as you will see later.

Making the flyer an even more official bulletin, the names of FDOH and the Agency for Toxic Substances and Disease Registry (ATSDR) appear on the letterhead sanctioning the flyer with implication of careful study, etc.

One of the errors immediately prominent in the flyer is, "there are no chemicals found off-site." It is well known within the community that the low level radioactive slag containing high levels of arsenic, beryllium, etc. was sold to contractors and citizens for fill, driveways, and to agencies such as DOT for road beds. Stauffer also crushed slag into aggregate for the concrete industry which was used in foundations, roofs, and so forth.<sup>171</sup>

In response to the criticism regarding the worker safety announcement and how it was handled, Merchant, of FDOH, wrote the following:

Ms. Malinowski is concerned about the 1996 fact sheet. An important part of FDOH's program is to inform nearby communities of our findings. In 1996 FDOH produced a fact sheet to meet community demands for more information. This fact sheet was based on the 1993 public health assessment report. Stauffer paid to have this fact sheet widely distributed. If FDOH or ATSDR had paid to distribute this fact sheet, Stauffer would have eventually paid for it through EPA's cost recovery program. The fact sheet contained the statement:

**There are no chemicals from the Stauffer plant off the site** [emphasis added].

In an attempt to write this fact sheet at a reading level for the general public, FDOH had oversimplified the fact that:

There are no chemicals from the Stauffer plant off the site **at levels likely to cause illness** [emphasis added].

FDOH will reiterate that fact that there are no chemicals from the Stauffer plant off the site at levels likely to cause illness in a new public health assessment report. This information has been shared with community members.

The worker safety announcement increased the distrust citizens felt towards FDOH, and thus vicariously, ATSDR. The statement that “There are no chemicals from the Stauffer plant off the site” is not only untrue but is also a baseless claim and demeaning to the residents who tolerated the fumes, gases, and dust from the plant for 35 years. Further alleging that there was a need to oversimplify so that residents would understand the facts better—but creating a false statement in the process—is a claim that cannot be taken seriously. Adding the words, “that are likely to cause illness” would have made the statement true and *still* would have been understood by everyone in the community, regardless of their education level. The alteration of a reasonable, true statement did, in fact, play into the hands and interests of Stauffer, the responsible party, and destroy community trust.

The assertion made in the worker safety announcement—that no chemicals were ever carried off the site—essentially implies that the plant operated in a bubble, that its workers did not carry a single grain of silica or an asbestos fiber on their shoes or clothing when they left the premises. However, the record of the plant operation shows that workers *did* transport materials off-site not only on their clothing, but in their lungs as well.

To further complicate matters, FDOH let Stauffer, the responsible party, distribute the worker safety announcement, which is a governmental function. Stauffer may generate and distribute whatever materials they wish regarding the site. However, under no circumstances should Stauffer be the sole distributor of ATSDR/FDOH public education materials. Merchant claims

that Stauffer would eventually have been responsible for funding the flyer, which is true, because attempts would be made to recover *all* the costs associated with the site. However, distributing the information is a governmental function and failing to uphold the standards of good government served to inflame the community at worst and exacerbate its distrust towards the government at best.

In part, FDOH's action may have been proof of the agency's inability to communicate with the public, because, as Tuovila is quoted in the Pi-Pa-Tag letter, "the agency has no direct way of communicating with the public."<sup>1</sup> If this argument is true, consideration must be given to providing ample staffing to keep the public informed. In fact, Lu Grimm now works with FDOH to coordinate community activities (the ombudsman has no records of when she took that function).

#### ***FDOH Seeks Assistance for Former Workers***

FDOH tried to obtain medical assistance for former workers of Stauffer (see Chapter 7 for details). Furthermore, when it appeared that the National Institute for Occupational Safety and Health (NIOSH) would not get involved, FDOH created a worker safety announcement in 1996 for the former workers, and a letter to healthcare professionals.

In late 1996, FDOH began an attempt to notify former workers of potential health impacts from working at Stauffer. FDOH asked Stauffer for a list of all the former workers at the site.<sup>172</sup> Michael Kelly, Stauffer's attorney, agreed to provide a list (which FDOH received on a computer disk in March 1997) and also suggested changes to the worker safety announcement and to the letter.<sup>173</sup>

FDOH's worker safety announcement incorporated many of the suggested changes, including the stipulation that workers needed to have been exposed to chemicals at the plant for one year or more, effectively shutting out those workers with a short duration exposure.<sup>174</sup> The change also implies that diseases have a timer which starts only after 365 days. In a letter dated June 6, 2000,

Merchant, of FDOH, wrote that,

Certainly, if some former Stauffer workers could have been exposed for more than a year, some could have been exposed for less than a year. The point in both of these fact sheets, however, was that the estimated exposure to arsenic in the on-site soil for longer than a year could increase the risk of skin cancer in former workers. This point was based on pages 19-20 of the 1993 FDOH/ATSDR Preliminary Public Health Assessment-Stauffer Chemical Company/Tarpon Springs. This in turn was based on the ATSDR toxicological profile for arsenic. ATSDR toxicological profiles define chronic exposure as greater than or equal to 365 days.<sup>175</sup>

The worker safety announcement, which is limited to arsenic and radioactive elements in the soils, ignored many other contaminants to which the workers were routinely exposed, like asbestos, silica dust, phosphorus pentoxide, radium-226, and more. Many of these contaminants do not require a full year of exposure to generate a health impact. For example, asbestos could require a single exposure, under the right circumstances, but does have a longer period of latency to display health problems. As Andrew Myers, M.D., remarked, “In some people, with some toxins, some pulmonary toxins, some pulmonary irritants, a single exposure is enough to set off this process, which will become chronic and will continue to scar over a period of time.”<sup>176</sup>

While the 1993 preliminary PHA does little to address asbestos, the fibers were used extensively at the site, in both raw and rope form. However, the worker safety announcement does not address asbestos, or many other chemicals of known human health impact. In fact, it even ignores the fact that during their employment and service at the site, workers also breathed contaminated air and drank from potentially contaminated wells.<sup>174</sup>

The letter to the healthcare professionals also incorporated most of Stauffer’s suggestions, and added the requirement of working at the plant one year before health impacts could occur.<sup>177</sup>

FDOH was heavily criticized for the effort because it (1) showed Stauffer’s influence, (2) mandated the 1 year exposure limit, (3) limited contaminants to arsenic and radionuclides, and (4) cited contact with soil as the only pathway of exposure.



In his letter to Tuovila, Dr. Singh, of NIOSH, addressed the worker safety announcement's content this way:

The fact sheet's statement that former employees "may have some of the health effects if they were in frequent contact with the soil" is misleading. "Contact" with soil at an active industrial facility is usually a minor route of worker exposure compared with inhalation of process-related airborne dust. It is conceivable that, based on company industrial hygiene and other records, interviews with former plant personnel, and other knowledge of the process, one could ascertain more about occupational exposures. But absent such an assessment, it would be difficult to develop an informative exposure message for former employees.

Finally, there is the question of what a cohort member can do to mitigate the potential adverse health effect of the exposures in question. Even assuming that employee arsenic or radium exposure had been substantial, it is not clear that the medical advice in the fact sheet is applicable to this cohort. The statement that "screening tests, early diagnosis, and treatment are the best steps you can take to protect your health" may be true for some conditions, but not necessarily for the cancers caused by arsenic (skin, liver, bladder, kidney, lung) or radium (bone). Screening for these diseases in asymptomatic people, even those at higher risk as a result of occupational exposures, has not been shown to reduce morbidity or mortality. (US Preventative Services Task Force. 1996. *Guide to Clinical Preventative Services*, 2<sup>nd</sup> ed. Baltimore: Williams and Wilkins.)<sup>178</sup>

### ***Jessie Burke Incident***

In early 1999, FDOH encountered still another major problem, involving Jessie Burke, a Tarpon Springs resident. Burke, the widow of a former Stauffer employee, and actively involved in the Stauffer issue, was accused of having threatened to place a bomb in the conference room of the plant. In report No. 99-87985, deputy Charles Gilmore indicates that Frank McNeice, site manager, stated that the complaint had come via Beth Copeland, of FDOH. Gilmore reported his April 29, 1999 conversation with Ms. Copeland as follows:

Copeland stated an advocate for environmental protection causes named Mrs. Burke had made the comment to Copeland over the telephone one day last week. I asked Copeland what the specific conversation involved and she stated to me as follows: Burke supposedly said, "If I were able to I'd blow them away." At this point, Copeland asked, "What do you mean? Would you hurt people?" Burke stated, "No, I'd do it when nobody was there and I would put it under a table." Copeland then stated, "No, I don't think you would because people would get hurt and that's not what you want to do. That would not help your

cause.” Copeland stated that she then changed the subject of the conversation with Burke and said Burke immediately began talking about a different matter.

I terminated my conversation with Copeland and spoke with the site manager, McNeice. McNeice stated that he knew Mrs. Burke and added that she is currently suing Stauffer for a wrongful death involving Burke’s husband. McNeice stated her husband worked in the plant in the 60s and died of lung cancer which Mrs. Burke claims was caused by the chemicals at the plant. McNeice states he felt better knowing the allegation came from Mrs. Burke because he did not feel she could carry out the threat either or that she would seriously do such a thing.

Gilmore spoke with Burke, who denied the charge. Gilmore noted that Burke walked with a limp, had swollen ankles, and used a cane to walk long distances.<sup>179</sup>

The case was assigned to Corporal Richard North, who spoke with Burke on May 6, 1999, when she again denied the claim. North wrote in his report No. 99-87985/1 that,

I asked Jessie if she had made a bomb threat to Stauffer Chemical. She advised that she had not. I asked her if she made any comments in passing that she would like to see the place blown up. She stated that she did not... Jessie emphatically denied anything of this nature... At this point in time I can find no evidence that Jessie made any such threat to, or about Stauffer. Based on the ongoing litigation between the two I can see the possibility that either party would attempt to discredit the other.<sup>180</sup>

On May 11, 1999, Gilmore completed report number 99-87895/2, in which he states that,

On this date, I received copies of e-mail transmissions from an employee in Beth Copeland’s office named Lu Grimm, received from a Teresa Nastoff out of Atlanta (ATSDR employee) in reference to a conversation between Mrs. Burke and Nastoff.

Nastoff e-mailed to Grimm that Burke allegedly stated an educational program for environmental issues concerning Burke’s community better not be a ‘white wash attempt.’ Burke stated she felt the community may end up resorting to using violence if the program was in fact a ‘white wash attempt.’ Nastoff stated, ‘That’s the furthest she went with it,’ referring to Burke not providing any additional information in regards to violence in the community.<sup>181</sup>

The ombudsman asked Nastoff for a copy of the e-mail mentioned by Gilmore. Nastoff’s e-mail does not mention such a threat.<sup>182</sup> While no one would quarrel with Copeland’s concern for the protection of others, based upon the sheriff department’s findings, it is questionable whether the

event even occurred. If it did, it is deplorable and unjustifiable. However, Burke is in poor health, beyond retirement age, and has limited transportation available. Even if she did make such a threat, there is virtually no way she could have carried it out.

### ***Conclusion***

Once again, the community found a means to distrust FDOH. Many feel the Burke episode was an attempt to squelch an opponent of FDOH and of Stauffer. While it is justifiable to be concerned about violence and make every attempt to avoid or prevent such actions, charges made must be supported.

Opinions regarding FDOH's actions at Stauffer obviously differ. However, in most any conversation with the public regarding the state's effort or products, there is one central recurring theme: the residents did not trust Bruce Tuovila, who wrote most of the health materials. In fact, many felt, and have alleged that, at a minimum he was working in the interest of Stauffer. The ombudsman inquiry did not seek to prove or disprove this allegation, giving the benefit-of-the-doubt to a professional state employee. The public's feelings were further exacerbated when Tuovila resigned from his state position, effective July 8, 1997, to work for a Stauffer contractor.

Although the ombudsman has never met Tuovila in person, he has spoken to many people who have met him, and can draw one conclusion: whether it was how Tuovila presented himself or how he presented the materials to the public, he had a unique way of creating distrust, and in some cases, outright hatred. It is possible that the message Tuovila presented was not one the public wanted to hear, but even in such cases, the message, not the messenger, is hated. Simply put, everything seems to indicate that Tuovila was not a good communicator and that he antagonized and alienated the community from day one.

With such a high level of distrust in place, citizens of Tarpon Springs felt that the state did not have their interest at heart. In fact, it was the public's perception that—rightly or wrongly—the state was biased in favor of Stauffer.

Residents of Tarpon Springs also found it highly unusual that when Stauffer needed the services of a toxicologist, they selected Teaf, the toxicologist FDOH had contracted to conduct public health education in the area. On June 9, 1997, an FDOH purchase order bought 15 hours of Teaf's time, to conduct the education project, including grand rounds at Helen Ellis Memorial Hospital. On August 27, 1997, Teaf informed FDOH that he was being retained by Stauffer "in a private capacity to provide toxicological support in several areas."<sup>183</sup>

This was the second instance of an FDOH employee or contractor who was involved with the Stauffer site going to work for Stauffer. The situation is odd at best and raises issues of conflict of interest. While the state has no control over an employee's resignation or a contractor accepting new clients and creating a potential conflict of interest, one can clearly understand why the public would be concerned and draw conclusions which are damaging to the state.

## **Chapter 6: The Gulfside Elementary School**

In the fall of 1977, the Pasco County School Board opened the Gulfside elementary school at 2329 Anclote Boulevard in Holiday, Florida. The school was located directly across from the Stauffer Chemical Company plant, and the slag crushing operation.<sup>14</sup> For the next 4 years, both the school and the plant operated in close proximity.

### **FDOH Produces a Health Consultation Regarding Gulfside Elementary School**

After the community expressed concerns about the potential health impact to children's health from the plant operation, the Florida Department of Health (FDOH) produced a health consultation (HC) regarding the school, which was based on soil and air samples taken at the school in 1989 and beyond.<sup>14</sup>

In April 1989, EPA took two surface soil samples, which were analyzed for chromium, lead, and manganese. On July 21, 1993, Stauffer contractors collected three surface soil samples, between 0 and 3 inches deep, which were analyzed for metals, cyanide, fluoride, total phosphorus, radium-226, and polonium-210. On February 21, 1996, Stauffer contractors collected and analyzed nine more surface samples.<sup>14</sup>

Between July 10 and August 11, 1997, contractors for the Pasco County School Board collected 10 air samples (four outside and six inside the school building) and 21 surface soil samples (between 0 and 3 inches deep). The air samples were analyzed for phosphorus, phosphorus pentoxide, phosphoric acid, and asbestos. The soil samples were analyzed for total phosphorus, phosphoric acid, and asbestos.<sup>14</sup>

On September 19, 1997, contractors for the Pasco County School Board collected three soil/aggregate samples from beneath asphalt paving, two samples of asphalt paving materials, and one sample of roofing aggregate from the school building. The samples were analyzed for various radiological properties, including polonium-210 and radium-226.

Table 11, taken from the HC, shows the maximum level of each chemical of potential health concern in aggregate, soil, and air samples collected at the school. Chemicals not shown in the table are below levels of human health concern.

**Table 11. Maximum Contaminant Levels in Soil/Aggregate and Air Sample** <sup>14</sup>

Contaminant	Maximum Concentration	
	Soil/Aggregate	Air
Antimony	13.2 mg/kg*	NA†
Arsenic	0.6 mg/kg	NA
Chromium	23.9 mg/kg	NA
Phosphoric acid	7.3 mg/kg	ND‡
Phosphorus	NA	11 µg/m <sup>3</sup> §
Polonium-210	2.9 pCi/g	NA
Radium-226	1.99 pCi/g	NA
Vanadium	17. mg/kg	NA

\*mg/kg: Milligrams per kilogram of soil.

†NA: Not analyzed.

‡ND: Not detected.

§µg/m<sup>3</sup>: Micrograms per cubic meter of air.

pCi/g: PicoCuries per gram of aggregate.

While the HC suggests that no soil samples were analyzed for phosphorus, Weston, the Stauffer contractor for the February 1996 sampling, analyzed 11 samples for total phosphorus, with ranges between 5.4 mg/kg and 63 mg/kg. Four of the samples surpassed 20 mg/kg.<sup>184</sup> Additionally, results from the 1993 sampling yielded phosphorus results ranging from 174 to 1100 mg/kg. Two of the samples produced results of 826 mg/kg or more.<sup>184</sup>

The HC concluded that, based on the information reviewed, “illnesses are unlikely in adults, pica children, and non-pica children from exposures to contaminants in soil, aggregate and air at the

school.” FDOH recommended no further health action regarding the soil, aggregate, and air at the school.<sup>14</sup>

### **Local Citizens Want More Studies**

However, local citizens remain unconvinced that sound science has been applied or that full consideration has been given to health issues regarding the school. Their understandable concerns for the school and the potential health impacts focus on (1) the current conditions and (2) the conditions during the 4-year period (1977–1981) when the school was open and the plant was operational.

No test data from the school exist before 1989—12 years after the school’s opening. Most available data are from 1993 forward—16 years after the school opened. While one could technically allege that the conclusion and recommendation of the HC was based on limited data, one could also allege that the HC only addresses present and future health impacts.

In early 2000, Mary Mosley, a local environmental activist, sent the ombudsman a letter requesting assistance to conduct a study of the children who attended the school. Mosley was worried about the contaminants of concern currently listed for the site by EPA and other contaminants which had been listed as a concern for the site, particularly asbestos.<sup>185</sup>

Chapter 4 of this report discusses asbestos use at the plant. According to Stauffer and its former employees, asbestos was heavily used in the operation and much of it seemed to disappear from the equipment. Therefore, the likelihood of asbestos becoming airborne and traveling towards the school, where students would inhale it, is a serious and legitimate concern.

Mosley also raised questions about a document by Robert Dale, Stauffer’s industrial hygienist, which records his concerns for contaminants such as anhydrous, arsine, arsenic, asbestos, carbon monoxide, fluorides, hydrogen sulfide, lead, phosphine, phosphorus, phosphorus pentoxide, respirable dust, total dust, welding fumes, and noise.<sup>186</sup>

Phosphorus pentoxide, which became airborne when the furnace was tapped, was a common sight at the plant; it would form a cloud over the furnace area and move with the prevailing winds.<sup>187</sup>

### **Air Monitoring**

While little air emissions data exist for the early period of the plant's operation, an air monitoring station was installed in July 1977, near the southeast corner of the Stauffer plant. Air samples for sulfur dioxide (SO<sub>2</sub>) were collected by a 24-hour bubbler and 3-hour continuous monitoring.

SO<sub>2</sub> near the plant exceeded the Florida standard until 1980, when a dramatic change occurred. Stauffer began to cease the Tarpon Springs operation around that time.

Table 12 lists the maximum annual SO<sub>2</sub> levels from 1977 to 1981.<sup>13</sup>

**Table 12. Maximum Annual Sulfur Dioxide Levels from 1977 to 1981**

Year	Sulfur Dioxide			
	24-Hour Bubbler		3-Hour Continuous	
	mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>	ppm
1977	715	0.28	1877	0.72
1978	907	0.35	1550	0.60
1979	592	0.23	2026	0.78
1980	201	0.08	569	0.22
1981	149	0.06	463	0.18

From May to July 1979, the owners of Flaherty Marina, adjacent to Stauffer, kept a log of emissions problems.<sup>188</sup> Personnel at the marina complained of burning eyes and throat, headache, nausea, tightness of the chest, and difficulty breathing until the fog passed.

Table 13 logs conditions in the area as recorded by personnel at the marina.



**Table 13. Conditions in the Area as Recorded by Flaherty Marina Personnel in 1979**

<b>Date</b>	<b>Time</b>	<b>Conditions</b>
May 31	07:50 p.m.	Couldn't see, even with headlights (seven witnesses)
June 11	06:10 p.m.	Complete blackout, seemed to come from about base of new stack
June 15	12:11 p.m.	Complete visibility loss
June 16	08:30 a.m.	Complete visual obscurity
June 18	03:12 p.m.	70% visibility loss
June 20	04:00 p.m.	90% visibility loss
June 23	01:10 p.m.	100% visibility loss
July 04	08:10 a.m.	100% visibility loss
	09:10 a.m.	90% visibility loss
	10:10 a.m.	70% visibility loss
	10:40 a.m.	75% visibility loss
July 15	11:45 a.m.	90% visibility loss

Dan Flaherty, owner of the marina, told the ombudsman that emissions from the plant damaged the high-gloss paint on a boat in the marina and that he had to completely repaint the boat. He further alleged that with all his complaints, nothing was done until he called the attorney general.<sup>189</sup> On April 12, 1997, Flaherty told the *St. Petersburg Times*, “That stuff was toxic enough that when they had one flash in the furnace building, several hundred pigeons were killed. They were flopping in the air.”<sup>190</sup>

On October 11, 1979, a warning letter (No. 52-79-10-168) was sent to Stauffer, resulting from complaints of excessive smoke, fumes, odor, and particulate emissions. The warning letter, prompted by citizen complaints and subsequent inspections/surveillance, listed seven identified violations.<sup>191</sup> Stauffer responded to the warning letter and specifically outlined revised efforts to control phosphorus pentoxide and particulate emissions.

In December 1979, PED Co Environmental, Inc., a contractor for EPA Region IV, conducted a field inspection of the facility, and found that many parts of the operation were in compliance with applicable air standards. However, the inspector found problems with the furnace and the slag pit areas. Allowable emissions for the furnace were listed at 30.566 pounds per hour (lb/hr) (tapping) and 30.09 lb/hr (flushing).<sup>35</sup> While the furnace complied with particulate emissions, the hood did not capture all emissions. The total emissions were estimated at 83.4 lb./hr, plus the uncontrolled hood loss. The inspector said that,

The major reason for the emission of uncontrolled particulate emissions from the flushing and tapping operations are the intense heat of the slags and the quantities produced... It is our opinion that improvements in hood design can reduce fugitive emissions within the furnace area, but the emissions from the slag pit and slag run out of the building cannot be controlled by hooding.<sup>35</sup>

The particulate sources, with the exception of the tapping operation, appear to be well controlled and operated at near peak performance. The emissions from the slag tapping operations, however, appear to have impact on local total suspended particulate levels. The submicron nature of the plume and its low level of release do not allow adequate dispersion of the emissions.<sup>35</sup>

On February 6, 1980, Jean Graf, a research scientist for IIT Research Institute, sent a letter to Wayne Martin, of the Pinellas County Air and Water Quality Division, discussing results of five air samples from the site. Graf concluded that fugitive emissions relating to materials handling were the main cause of total suspended particulate (TSP) levels near the site.<sup>49</sup> Graf detailed the findings of microscopic analysis of air emission samples in two letters to Martin dated October 12,<sup>50</sup> and November 2, 1979, respectively.<sup>51</sup>

On February 25, 1980, Joyce Gibbs, chief of the Pinellas County Air and Water Quality Division, sent a memorandum to Jacob Stowers, director of the Florida Department of Environmental Management, summarizing sample analysis results greater than 75 mg /m<sup>3</sup>.

Table 14 recounts the data, which was not originally in table format.<sup>52</sup>

**Table 14. Microscopic Analysis of Tarpon Springs TSP Filters\***

Date	TSP	Material/% Weight	Comment	
04/26/78	185	- Quartz, feldspars	8.3	Phosphate processing emissions were the primary sample components
		- Carbonates	9.1	
		- Recrystallized sulfates, nitrates	10.1	
		- Roasted, raw phosphates	33.1	
		- Coke	7.3	
02/08/79	162	- Recrystallized sulfates, nitrates	14.0	Phosphate processing emissions were the primary sample components
		- Roasted, raw phosphates	26.0	
		- Coke	15.0	
02/26/79	130	- Quartz, feldspars, carbonates	8.8	Phosphate processing emissions were the primary sample components
		- Recrystallized sulfates, nitrates	17.3	
		- Roasted, raw phosphates	29.9	
		- Coke	18.0	
04/15/79	136	- Quartz, feldspars	7.9	Phosphate processing emissions were the primary sample components
		- Carbonates	9.5	
		- Recrystallized sulfates, nitrates	11.0	
		- Roasted, raw phosphates	35.6	
05/21/79	98	- Quartz, feldspars	7.6	Traffic impact was relatively strong
		- Carbonates	18.2	
		- Recrystallized sulfates, nitrates	11.41	
		- Raw, roasted phosphates	6.7	
		- Coke	6.7	
		- Semi-fused fe-rich phosphates	12.4	
06/26/79	110	- Quartz, feldspars	12.61	Wind and traffic suspended soil were the major sample components. The local phosphate plant was a <i>relatively</i> minor source.
		- Carbonates	6.810	
		- Recrystallized sulfates, nitrates	.6	
		- Roasted, raw phosphates	12.0	
07/20/79	108	- Quartz, feldspars†	—	Emissions from phosphate rock processing were very minor sample components
		- Carbonates	—	
		- Rubber tire fragments,	—	
		- Recrystallized sulfates, nitrates	—	
07/26/79	80	- Quartz, feldspars	—	—
		- Carbonates	—	
		- Rubber tire fragments,	—	
		- Recrystallized sulfates, nitrates	—	
		- Roasted phosphates	—	

\*TSP: Total suspended particulates.

†Due to the nature of paper, percentage weights cannot be given.

### **Excessive Air Pollution at Stauffer**

Complaints about air pollution were documented until shortly before the plant closed. On March 4, 1980, Gibbs transmitted the memorandum "Summary of Stauffer Chemical Company Complaints," to Stowers, outlining 30 complaints from May 19, 1975, to December 9, 1979. One complaint was accompanied by a petition signed by 24 persons and nine letters asking the state to deny Stauffer's proposed permit. Another petition was a log of fugitive particulate emissions with photos.<sup>40</sup>

In March 1980, another petition signed by 149 people was sent to Gibbs, expressing concerns regarding air emissions and the health of children and wildlife. The petition mentions "a strong impact from calcium phosphate source which, I presume was a processing plant producing phosphates for fertilizers."<sup>41</sup>

On April 17, 1980, an air pollution episode occurred at Stauffer, the electric arc furnace malfunctioned and was shutdown. Visual emissions tests yielded average emissions of 69.5% and 93.75% in a 6-minute period. During a 1 ½ -hour period, a phosphorus pentoxide plume was observed, which did not abate; it engulfed the building and extended for ½ mile or more downwind. The prevailing winds carried the plume east-southeast over populated areas.<sup>47</sup> The episode occurred at 9:15 a.m. and emissions were visible until 6:15 p.m.

In addition to the violations of air emissions standards, a phosphorus pentoxide episode occurred in 1980. Between 1977 and 1981, the Occupational Safety and Health Administration found violations at least seven times, some were for multiple offenses. The TSP standard of 60 µg/m<sup>3</sup> was violated in Pinellas County from May 1, 1977, through the second week of August 1981.<sup>53</sup> TSP and SO<sub>2</sub> violations were recorded from 1977 to 1980 in Tarpon Springs, with the 24-hour TSP standard being violated 4 times, the 24-hour bubbler SO<sub>2</sub> standard being violated 5 times, the 3-hour continuous SO<sub>2</sub> standard being violated 10 times, and the 24-hour continuous SO<sub>2</sub> standard being violated 17 times. The TSP standard was met or exceeded 6 times in 1978 and 1979, and nearly met nine other times.<sup>54</sup>

On October 23, 1978, Larry George of the Florida Department of Regulation (FDER) wrote a memorandum to Dave Puchaty, also from FDER, regarding the August 15, 1978 report by Dames and Moore for Stauffer. George wrote that,

This report substantiates the Department's position that the sulfur dioxide ambient violations near Tarpon Springs are due almost entirely to emissions from the Stauffer Chemical Company phosphate kiln stack. Included in the report are ambient data collected by the company at a site 0.31 km north of the plant which indicate 10 exceedances of the 24-hour standard and 8 exceedances of the 3-hour standard during 1977.<sup>55</sup>

In 1979, the highest pollutant standard index (PSI, now known as the air emissions index) value recorded in Tarpon Springs was 400, with SO<sub>2</sub> listed as the responsible pollutant. This figure exceeded the highest value in Florida by nearly three times. The average PSI value for Tarpon Springs was 25, near the bottom for averages.<sup>53</sup>

In January 1979, the Florida Department of Environmental Protection (FDEP, formerly FDER), issued an air emissions delayed compliance order to Stauffer.

Compliance measurement of the Stauffer plant was a problem. Peter Hessling, of the Pinellas County Air and Water Quality Division, told the ombudsman that,

To the best of my knowledge, they never actually completed a stack test while I was inspecting, from 1980 forward. Something always went wrong, something was missing or didn't work. The main problem was when they tapped the furnace. It looked like the gates of hell glowing in the dark, it gave off steam and lots of emissions-phosphorus pentoxide.<sup>192</sup>

Pinellas County air quality improved markedly after Stauffer ceased operations in 1981. The 1983 air quality analysis reported a 28% reduction from the 1980 level.<sup>59</sup>

Table 15 details air emissions in Pinellas County from 1978 to 1983.

**Table 15. Stationary Sources Emissions Inventories (Tons/Year)<sup>59</sup>**

Emissions Type	Year					
	1978	1979	1980	1981	1982	1983
Particulate Matter	1,155.19	1,308.64	1,956.50	1,139.82	868.59	549.08
Sulfur Dioxide	27,813.39	31,859.57	33,652.55	30,241.61	27,312.68	17,838.80

While a total picture of the air available to the students of the Gulfside elementary school cannot be drawn, it is clear that they were spending a large amount of time in an area with an excess of SO<sub>2</sub> from 1977, when the school opened, to 1981, when Stauffer ceased operations.

#### **The Slag Crushing Area Emits Excessive Dust**

Another major consideration for the health of former students is the location of the slag crushing area, just across Anclote Boulevard. Dust filled with a multitude of contaminants from the operation had very little distance to travel to reach the children. Little testing has been done to determine whether the slag may have contained some of the missing asbestos. If the slag contained asbestos, it would be reasonable to assume that some of the fibers reached the school amidst the dust of the slag crushing.

On January 6, 1998, Mosley made the following remark in a *St. Petersburg Times* article: “the [dust] was on their [the children] trays, on their hands. It was in the air they were breathing. We need to look at that.”<sup>193</sup> Mosley is not the only person calling for a study of the students. She is joined by Dr. Tom Mason, chair of the University of South Florida’s Department of Epidemiology and Biostatistics, who concurs with her. To conduct the study, Mason (or another investigator) would need the cooperation of a large number of the school’s students, past and current. He further stated that, “Before you go about mounting a study, the front end is how completely you can reconstruct and identify the whereabouts of 90 percent of the total. If you can only find half of them, then you’re in trouble.”<sup>194</sup>

During a February 12, 2000 hearing conducted by Congressman Michael Bilirakis and the EPA Hazardous Waste ombudsman, Mason argued that,

Appropriate science was not followed, that defensive approaches to these particular studies has never been pursued. I do not know what the answer is but I know what the questions are, and I know how to address the questions. What concerns me, what concerns me seriously, is that there appears to have been degradation, if you will, of the quality of the approach through time.<sup>195</sup>

In response to a question from the congressman, Mason said that,

Let me be very clear for the record. At this particular point in time what needs to be done is a complete assessment of the populations who had potential for exposure. I don't want to test anyone right now. What I want to know is, I want to know who was there, I want to know where they lived, I want to reconstruct families. I want to passively follow them through the Florida Cancer Data System... I don't think at this particular point in time the collection and acquisition of biological materials from every person who resided in proximity of Stauffer Chemical is scientifically sound or advisable or defensible, but I do argue that at some point in time it may be, but we will never know if it may be if we don't do the first steps... We do need to basically now pursue in a much more aggressive, systematic way the reconstruction of those cohorts, to follow those cohorts prospectively against the registries that we have. We can do it in a very time and cost effective, efficient manner, get answers to some of the intermediate questions along the way and use that to plan what arguably will be then a scientifically defensible surveillance system. But now is not the time to go and collect materials and try to address global questions, we have to go systematically.<sup>195</sup>

### **Proximity of the School to the Plant Affects Children**

Because of the proximity of the school to the plant, it is easy to see the possibility, or even likelihood, that emissions made their way to the school. The slag crushing operation, a major dust producer, was less than a football fields' length from the front door of the school. While Stauffer was making major headway in its effort to reduce emissions, the record shows that the school and the city continued to receive an excessive share of air pollution. Therefore, one can reasonably conclude that if contamination happened at Stauffer, it happened at the school, which was very close to the plant.

Chapter 7 of this report discusses the exposure of former plant workers to various contaminants known to impact health. These contaminants often traveled the short distance to the school. For this reason, an attempt must be made to assess the health of the children who attended the school while the plant was still in operation.

Beginning in 1975, Stauffer became so concerned for the health of its employees that it initiated an industrial hygiene program and developed exposure records on 600 employees.<sup>196</sup> While such a program is admirable, it still raises the following question: “What about the health of the children across the street?” It has never been assessed.



## Chapter 7: Former Victor/Stauffer Workers

“You could hardly see for the dust. Your nose would be full of black dust, your whole face would be black,” Harland Kingsley said of his working days at Stauffer.<sup>34</sup> While workers wore loose felt dust masks, they might wear the same mask for six months without it being replaced. Kingsley added. “You’d keep [the mask] forever until it fell apart.”<sup>34</sup>

### **Stauffer Site Categorized as a Public Health Hazard in 1993**

In 1993, the Florida Department of Health and Rehabilitative Services (FDHRS), now the Florida Department of Health (FDOH), conducted a preliminary public health assessment (PHA)—with limited data—and categorized the Stauffer site as a public health hazard.<sup>4</sup> Although the preliminary PHA did not discuss extensively issues relating to the use of raw asbestos or to the health of former workers, it did make the following recommendation:

1. The Occupational Safety and Health Administration (OSHA) and National Institute for Occupational Safety and Health (NIOSH) should consider conducting medical monitoring on the workers at the site. Workers currently on the site should be provided with appropriate protective equipment while working around contaminated soil/sediment.<sup>4</sup>

### **NIOSH Involvement**

#### ***FDOH Asks NIOSH to Investigate***

In July 1996, Bruce Tuovila, of FDOH, followed up the recommendation in a letter to David Sundin, chief of the Hazard Evaluation and Technical Assistance Branch of NIOSH, explaining the determination of the hazard and the concerns of one former worker’s widow for the health of other workers. Tuovila asked NIOSH to obtain a list of union workers who formerly worked at Stauffer from the International Chemical Workers Union in order to send them a worker safety announcement, which was included in the letter. Tuovila did not ask that medical monitoring be provided to the workers.<sup>197</sup>

### *NIOSH Refuses to Investigate*

On August 12, 1996, Mitchell Singal, M.D., senior medical officer of the Hazardous Evaluations and Technical Assistance Branch, Division of Surveillance, Hazard Evaluation and Field Studies at NIOSH, wrote the following response:

All new NIOSH studies now have a worker notification component, and NIOSH has also undertaken notification of members of cohorts studied in the past. I am not aware, however, that we have ever undertaken individual notification of a cohort of workers who were not part of a NIOSH study. Your request is thus not only unusual for the health hazard evaluation program, but the task would be unprecedented for NIOSH. Furthermore, it is not as straight forward as it may seem.

First, cohort members would have to be identified and traced. Even if a list of former workers is available from the union, as you suggest, determining vital status and, for living persons, current address is typically a time-consuming endeavor. Second, composing the notification message would be difficult. Such messages are usually based on an epidemiologic study and knowledge of exposures at the workplace of concern. In this case, however, there are neither occupational exposure nor health outcome data available, only the presence of toxic substances at the site and a report of one case of a common cancer. The fact sheet's statement that former employees "may have some of the health effects if they were in frequent contact with the soil" is misleading. "Contact" with soil at an active industrial facility is usually a minor route of worker exposure compared with inhalation of process-related airborne dust. It is conceivable that, based on company industrial hygiene and other records, interviews with former plant personnel, and other knowledge of the process, one could ascertain more about occupational exposures. But absent such an assessment, it would be difficult to develop an informative exposure message for former employees.

Finally, there is the question of what a cohort member can do to mitigate the potential adverse health effect of the exposures in question. Even assuming that employee arsenic or radium exposure had been substantial, it is not clear that the medical advice in the fact sheet is applicable to this cohort. The statement that "screening tests, early diagnosis, and treatment are the best steps you can take to protect your health" may be true for some conditions, but not necessarily for the cancers caused by arsenic (skin, liver, bladder, kidney, lung) or radium (bone). Screening for these diseases in asymptomatic people, even those at higher risk as a result of occupational exposures, has not been shown to reduce morbidity or mortality. (U.S. Preventative Services Task Force. 1996. *Guide to Clinical Preventative Services*, 2<sup>nd</sup> ed. Baltimore: Williams and Wilkins.)

In summary, little information about Stauffer/Victor worker's occupational exposures is currently available, the cohort has not been studied epidemiologically, and there is no

clearly beneficial medical screening available for persons formerly exposed to arsenic or radium. Therefore, the primary justifications for worker notification in this case would be non-medical, that is, knowledge of possible exposures for its own sake or for economic or legal purposes. There are legitimate reasons to inform workers of their exposures, but we are not currently in a position to undertake either an occupational exposure assessment or an epidemiologic study of the cohort in question. For this reason, we do not think that a NIOSH worker notification project for this cohort is warranted. The assistance you requested, distribution of a non-NIOSH fact sheet to a cohort of former employees with whom NIOSH has never been involved, is beyond the mandate of the NIOSH health hazard evaluation program.<sup>178</sup>

Notwithstanding Singal's comment that NIOSH would not get involved, NIOSH somehow nevertheless received a list of former Stauffer workers from the union. On September 16, 1996, Singal sent the following letter to Tuovila regarding the list:

As you know, the International Chemical Workers Union sent us a list of union members who worked at the former Stauffer plant in Tarpon Springs. The list contained 120 names, only 42 of which also had social security numbers. According to our social security data file, all but one of the 42 persons are still alive. The deceased person is Russell Holden.

Unfortunately, the social security data file does not provide addresses. Since our program for matching a list with the social security data file requires a social security number, we are unable to determine the vital status of the 78 persons on the list without a social security number.<sup>198</sup>

### ***Citizens Try to Get NIOSH Involved***

In an interview with the ombudsman, Jessie Burke, widow of Leonard Burke, a former Stauffer employee, explained her efforts to get NIOSH to provide medical monitoring for the employees. She stated that, "I talked to NIOSH and they said they would look into it if they had a request from a former employee. We got a former employee to write the letter, send it certified mail, return-receipt requested. They denied ever getting the request. They ignored us."<sup>199</sup>

The letter, dated April 8, 1998, was from George Psaras, who expressed concerns for diseases and cancers and asked for a health assessment of the area. The return-receipt card indicated that NIOSH had received the letter on July 21, 1998.<sup>200</sup>

## **Stauffer Provides List of its Former Employees to FDOH**

### ***Stauffer Agrees to Provide List***

In late 1996, FDOH began trying to notify former workers of potential health impacts from their past employment at Stauffer. To do so, FDOH asked Stauffer for a list of all its former workers.<sup>172</sup> On February 7, 1997, Michael Kelly, Stauffer's attorney, wrote to Tuovila that Stauffer felt there was "no basis of law, on a state or federal level, for FDHRS [now FDOH] to procure SMC [Stauffer Management Company] the information [the list]." However, Kelly did agree—without waiving the company's right to contest the demand—to provide the information, although the task would be a large one because no list was available and approximately 150 boxes would need to be reviewed. On February 24, 1997, Kelly, sent Tuovila a list of 2,360 former plant workers.<sup>201</sup> In March 1997, Stauffer provided the same information on computer disk.

### ***NIOSH Contacts FDOH About List***

While the ombudsman found no record indicating how NIOSH obtained the list, on April 11, 1997, Sundin wrote to Tuovila the following, concerning the return of the list of names and social security numbers for former workers:

The listing shows that of the 2,360 names you supplied, 609 are not living, according to the Social Security Administration (SSA) file. The listing of names shows those individuals who are not living, and some additional information, such as the name as it appears on the SSA file (for some SSNs, the name on the file you supplied us and the name listed for that SSN on the SSA file are different, so these cases may bear further investigation).<sup>198</sup>

## **FDOH Sends out the Worker Safety Announcement and the Letter to Healthcare Providers**

Following the failed attempt to have NIOSH conduct a study or medical monitoring, FDOH sought to develop a worker safety announcement to send to former employees. FDOH also began developing a letter employees could give to their physicians.

### ***FDOH Revises the Documents to Include Stauffer's Suggestions***

On February 10, 1997, Kelly sent Tuovila a letter, outlining major revisions to the proposed worker safety announcement and the letter to healthcare professionals.<sup>202</sup>

FDOH's letter to healthcare professionals incorporated most of Kelly's suggestions, and added the stipulation that only those workers who had worked at the plant for at least 1 year would be affected.

FDOH also incorporated many of Kelly's suggested changes in the worker safety announcement, including the requirement that it only apply to those workers who had been exposed to chemicals at the plant for 1 year or more.<sup>174</sup> This requirement would shut out those workers who were exposed to chemicals for a short duration only.

On June 6, 2000, after the ombudsman questioned the requirement for the 1-year exposure, Randy Merchant, environmental administrator of FDOH, wrote the following letter:

Certainly, if some former Stauffer workers could have been exposed for more than a year, some could have been exposed for less than a year. The point in both of these fact sheets, (the workers safety announcement and the letter to physicians) however, was that the estimated exposure to arsenic in the on-site soil for longer than a year could increase the risk of skin cancer in former workers. This point was based on pages 19-20 of the 1993 FDOH/ATSDR Preliminary Public Health Assessment-Stauffer Chemical Company/Tarpon Springs. This in turn was based on the ATSDR toxicological profile for arsenic. ATSDR toxicological profiles define chronic exposure as greater than or equal to 365 days.<sup>175</sup>

### ***Problems with the Worker Safety Announcement***

The worker safety announcement had two problems: it mandated a 1-year exposure and it ignored many contaminants to which the workers were routinely exposed. The worker safety announcement only mentioned arsenic and radioactive elements in the soils and ignored the many other contaminants present at the site, like asbestos, silica dust, phosphorus pentoxide, radium-226, and more. The document also ignored the fact that during their employment and

service at the site, the workers also breathed contaminated air and drank from wells which were probably contaminated.<sup>174</sup>

Many of the non-mentioned contaminants do not require a full year of exposure to generate a health impact. For example, asbestos—which was used extensively at the site both in raw and rope form—could create health problems with a single exposure under the right circumstances, but its latency period could be over a year. In his deposition in the workers compensation claim of former Stauffer employee Eugene Anderson, Andrew Myers, M.D, said that,

When it takes a matter of weeks or months for the symptoms to completely clear, it's logical to me that there's been some underlying structural lung damage caused by this.

It is also known that it only takes limited exposure in some people with some of these problems. In some of these conditions, it takes repeated exposures; and with each exposure, with each irritation, there is destruction of normal tissue, replacement with scar tissue.

In some people, with some toxins, some pulmonary toxins, some pulmonary irritants, a single exposure is enough to set off this process, which will become chronic and will continue to scar over a period of time.<sup>176</sup>

### *Asbestos*

In the asbestos section of chapter 4, Anderson indicated that the furnace required the use of four shovelfuls of raw fibrous asbestos to repack asbestos around the electrodes.<sup>65</sup> Stauffer considers this allegation “illogical.”<sup>66</sup> Yet, on November 25, 1986, during the initial trial phase regarding Anderson’s workers compensation claim, Charles Bentley, representing Stauffer and its insurance carrier, provided support for the large use of asbestos, stating that,

[The] Defense took those depositions, and the focus of that testimony was on the alleged use of powdered or fibrous asbestos.

And the evidence will show that those procedures (packing raw asbestos around the electrodes-added) were implemented from the forties to the mid-fifties, and that was **state-of-the-art thereafter** [emphasis added] different procedures, different state-of-the-art, and finally it developed into a water seal procedure.<sup>67</sup>

### **Reactions to the Worker Safety Announcement and the Letter to Healthcare Providers**

FDOH received eight written responses and 59 phone calls after they sent out the worker safety announcement.<sup>203</sup> One respondent said, “If any poisonous substance was in the materials, we men were the first to be infected. If any man at that time long ago in the late 50s **had been warned of the hazards all around us, the company would soon have been out of manpower** [emphasis added].<sup>203</sup>

On April 27, 1997, Mary Mosley wrote to James Howell, Florida’s health officer, expressing concerns about the worker safety announcement and the letter to healthcare providers.

Specifically, Mosley raised the issue of worker exposure to silica dust and asbestos fibers, and highlighted the exposures to phosphorus pentoxide gases and the findings in the workers compensation claim of Anderson, who had been exposed to asbestos.<sup>204</sup>

### **Was the Plant Safe?**

#### ***Yes, According to Stauffer***

Stauffer does not concur with the worker’s assessment of hazardous conditions at the plant.

From Stauffer’s viewpoint, no harm was done and no health impacts occurred. Kelly, Stauffer’s attorney, wrote that,

The 1993 public health assessment performed by the Florida Department of Health and Rehabilitative Services, in cooperation with the U.S. Public Health Service, did not conclude that any such ‘potential significant risk to human health’ exists with respect to individuals exposed to materials present at the Tarpon Springs Facility (the Site). In fact, the reports conclusions indicate a risk well below that threshold.<sup>205</sup>

#### ***No, According to Others***

Members of the community and former workers claim that working conditions at the plant were bad at best and terrible at worse. For example, consider the task of working on the furnace floor or walls, or as an employee called it, “the king of changes.” Because of the high heat (up to 2900F), the floor and walls would burn out. The furnace lining was made of a mixture of carbon

and other materials, about 24 inches thick. In his letter to FDOH, an employee describes this task—which was confirmed by five former workers in an interview with the ombudsman:

The burnt walls and floors had to be removed with chipping tools. The old materials would have retained the heat for weeks, but removal had to be ‘now.’ The entire crew was organized into three working teams, each of whom could not work on this hot material for longer than 20 minutes. The first team would spend 20 minutes inside the furnace, then get out to let the second team take a turn, then the third followed. Then the first came again—and so on. After days and nights of chipping out the old blocks, the new blocks had to be mounted and cemented in place. The outside wall of the furnace was made of steel plate. Heat detection sensors on all four walls and the floor had burned out too, so new ones had to be mounted and their wires connected to the furnace control room.

The rebuilding job was a soul-straining job for all the crew! No slaves, black or white, had ever been through such a torment in the past. I remember that the company doctor set up his emergency quarters in the lunch room, ready to take out of the furnace any man who fainted from the hellish heat in the devil’s roasting box. But I don’t recall any man exiting that way.

Working around the furnace was not just ‘hell’ when these repairs were being made, but all the time! The electrodes which heated the furnace were 40 inches in diameter and 16 feet long (two 8-foot lengths screwed together.) As the first 8-foot section burned off on the bottom side, another would be screwed on to the top—with the power off—by a crew of men working in all the fumes and the dust and heat.

Yes, the torture in hell could not be any worse, but we could not stop and sympathize with the workers. The work had to go on.<sup>203</sup>

Following are more workers’ comments:

We had a mud plant to make fire clay. We used bags of stuff in the bricks, which seemed to be asbestos or white insulation. We used it around the furnace for exposed wires. The only safety equipment was a long-sleeved shirt, ankle top boots, hard hat, visor and most people bought leather gloves.<sup>206</sup>

The conveyors had terrible dust, and we had no masks. We were never told of any hazards—but I don’t know if management knew. Phosphorus pentoxide was used when they tapped the furnace, and always in the evening. Anywhere in town you could see a cloud, see soot and fallout.<sup>207</sup>

We drank daily out of the water fountain there at the plant, which I’m now finding out was traced with known carcinogens. After going to a nephrologist and finding out that I had an



unusual disease (chronic glomerulonephritis, intraglomerular atrophy, or Berger's disease) brought on by unknown substances or origins, I had to wonder what in the world was I in for.<sup>203</sup>

As a work force, we were not aware of these dangers to our health, or that of the surrounding population... We spent two days and nights on this job in a very hot atmosphere. Huge clouds of dust encircled us, and breathing was so difficult that we had to cover our noses with dust masks... I realize now that even the minor 'creature comforts' at the Victor plant contained hidden threats to the health of us workers. In all that heat and dust, we were glad at least to have ample water to drink. But this water came from our 100-foot high process water tower, which was supplied from the outlying groundwater wells. We all drank many gallons of polluted water while doing our jobs—never knowing the danger.<sup>203</sup>

On November 14, I wrote a letter to my friend who had been furnace supervisor during my years at the plant. I received back a postcard from his widow. In it, she describes his death from colon cancer and asbestos-laden lungs. In your letter you mentioned the community concern about asbestos at the plant. When I read [name withheld] mention of asbestos in [name withheld] lungs, I immediately concluded that much asbestos was in [name withheld] office on the third floor of the furnace building, only yards away from the upper end of the furnace electrodes where the greatest heat was. I'm thinking that [name withheld] office used ample asbestos to protect him from the furnace heat! Perhaps the entire inside of the furnace was covered by asbestos. I'm also thinking that the office on the kiln's 'burner deck' was also lined with asbestos for the operators protection. The office got a lot of dust when the slag crusher operated.<sup>203</sup>

Harland Kingsley and the other four former workers who filed a class action suit against Stauffer, told the ombudsman that,

We were never given information on the hazards. We only had small masks. We used a raincoat to keep clean. There was so much dust you couldn't breathe, we had to stick our head out of the building to breathe—we had to stay on the job. Dust collectors were put in in 1955 or 1956. We had to use a broom and coal shovel to sweep up dust on top of the furnace. When they tapped the furnace, there was lots of steam and gas. If you were sick or injured, they would drag you into work, there was to be no accidents. We had to take dust from the precipitators two times in each 8-hour shift. It was so hot it was blue. We had to clean it out with water with all the gases and materials. In the 1970s, we used the rope form of asbestos, we brought it in by the boxcar. One person drowned, one was blown up and two burned to death. There were sprinklers all over to spray us if we caught on fire from the phosphorus. Pigeons would drink the water and die. Respirators were put in place in about 1977 or 1978.<sup>208</sup>

George McCall, of the Pinellas County Health Department, who spoke frequently with plant managers, told the ombudsman that “There were noticeable emissions when the slag was pulled out, but they tried to improve and reduce emissions in about 1961 or 1962 with collection systems. They looked good to me... They had phosphorus pentoxide, total phosphate and fluorides.” McCall also indicated that 10 sampling stations were installed near the plant.<sup>143</sup> While the sampling stations may have been in existence, the ombudsman was unable to locate any emissions data from the stations.

## **Cases of Diseases Related to the Plant**

### ***The Harland Kingsley Case***

In May 1998, Harland Kingsley and five other former workers filed a class action suit against Stauffer Chemical Company, Rhône-Poulenc, Stauffer Management Company, and six company officials, alleging that the company intentionally exposed them to hazardous waste products, including known cancer-causing toxins and agents in the workplace. “You could hardly see for the dust. Your nose would be full of black dust, your whole face would be black,” Kingsley said of his working days at the plant, and added “You’d keep [the mask] forever until it fell apart.”<sup>34</sup> As a matter of fact, workers often wore the same loose felt dust mask for 6 months or until it fell apart.<sup>34</sup> According to the class action suit filed by Kingsley and four other former employees,

The exposure was daily and constant including massive ingestion, inhalation and contact with known toxins and carcinogens during the manufacture and production of elemental phosphorus at the Tarpon Springs plant from 1948 to 1982. Carcinogenic exposure information was intentionally, deceitfully and unreasonably withheld from workers by all defendants.<sup>191</sup>

The suit seeks, among other things, the establishment of a medical program similar to the recommendation of the 1993 preliminary PHA “to monitor all living former workers for prompt and early detection of chemically and occupationally induced toxic and carcinogenic disease particularly lung, skin, bladder, kidney and liver cancers as well as asbestos related diseases such as asbestosis and mesothelioma.”<sup>191</sup>

### ***Five Cases of Interstitial Fibrosis Traced to Plant***

In July 2000, Brian Spiller, president of Stauffer Management Company, told the ombudsman that no one had been able to relate the working conditions at the plant to present health problems of former employees. However, in addition to the Kingsley case mentioned previously, the ombudsman found five instances where the relationship between conditions at the plant and the onset of disease can or has been drawn.

First, in the Anderson workers compensation claim, Anderson was found to have been impacted by asbestos, silica, and other emissions from Stauffer.

Furthermore, in an interview with the ombudsman and Carl Blair, ATSDR Region IV representative, Leonard Dunn, M.D., indicated that he had treated four Stauffer workers afflicted with interstitial fibrosis, three of whom are now deceased. Dunn said, “There is no question that the exposure (at the plant) lead to their condition.” Dunn further explained that the normal expectation for interstitial fibrosis would be one or two in a million.<sup>209</sup> In addition to these four cases, the ombudsman knows of at least one addition case, making the former employees of Stauffer beating the odds by five out of less than 2,750.

Dunn documented his opinion regarding the interstitial fibrosis diagnosis of Anderson. In a letter to Drew Tanney, Anderson’s attorney, Dunn wrote that “There is no question that if Anderson’s history is correct that lung injury could have resulted from occupational exposure.”<sup>210</sup>

### ***The Eugene Anderson Case***

Eugene Anderson’s diagnosis was confirmed by multiple physicians, like Myers, who wrote the following letter to Bentley, who represented Stauffer’s workers compensation claim insurance carrier:

Dr. Linden (Doctor No. 2) concludes that Anderson has lung disease ‘related to his repeated exposure to noxious gases’ and in the body of his report cites exposure to phosgene, sulfur dioxide, phosphorus, carbon monoxide and nitrous oxide. Dr. Jones

(Doctor No. 3 ) attributes the patient's pulmonary fibrosis to 'environmental causes' without further elaboration. In my opinion, (Doctor No. 4) Anderson's pulmonary difficulties at this time are related to his job exposure. He worked without pulmonary protection for a considerable period of time before respirators and monitoring of his pulmonary functions were provided by the company.<sup>211</sup>

Myers reinforced his opinion in a November 14, 1986 deposition, saying, "In my opinion, Anderson's pulmonary difficulties at this time are related to job exposure."<sup>176</sup>

In a July 7, 1986 deposition, another physician, Keith Chandler, related Anderson's condition to his job. To the question "Is the type of interstitial fibrosis, this diffused bilateral disease which you see on Mr. Anderson, consistent with a pneumoconiosis caused by either silica or asbestos?" Chandler replied: "It is not consistent with silica; it is consistent with asbestos."<sup>212</sup>

Stauffer's own doctor, to whom Anderson had been referred for consultation, rendered a report saying that, in his opinion, there was a cause-and-effect relationship between Anderson's exposure at the plant and his lung disease.<sup>67</sup>

Upon seeing convincing statements from multiple physicians, one can conclude that, (1) Anderson's health was clearly impacted by the working conditions at the plant, (2) it is highly unlikely that conditions at the plant were safe for **all other employees** and that only Anderson was exposed to harmful materials, and (3) it is highly likely that all, or most workers were exposed to such harmful materials for an extended time.

In an attempt to defer any health complication to the employee, Stauffer always raises the question of whether the employee was a smoker. While studies have confirmed that smoking is harmful and can expedite health problems from other sources, it should be noted that smoking is not illegal and that persons, including employees, are free to smoke.

In the January 31, 1985 deposition of Anderson, the issue of tobacco use was raised. The exchange centered upon Anderson's answering questions on forms in the physician's office.

Q: Okay. In each of these forms did you indicate any prior exposure to tobacco?

A: I'm sure I did.

Q: Okay. What was that, or have you ever been a cigarette smoker?

A: Yes, I have.

Q: Tell me about that. How long did you smoke cigarettes?

A: I started smoking when I was probably 15, 16, or something like that, and I quit, I think, when I was 21, and I quit for 15, 16 years, and I started back, smoked for a couple three years and I quit again.

Q: So how long did you smoke cigarettes overall?

A: Overall, probably seven or eight years.

Q: What brand of cigarettes did you smoke?

A: I remember smoking Marlboro. On occasion Lucky Strike, a Camel.

Q: How many packs of cigarettes a day did you smoke?

A: It varied.

Q: Between what and what?

A: Between probably one pack and three packs, depending.<sup>188</sup>

Anderson worked at the plant for 33 years, and there is no evidence that Victor or Stauffer was concerned about his smoking **until** the issue of workers compensation was raised. During the operation of the plant, the companies knew that employees smoked. Yet, there is no evidence that either firm ever counseled employees about the potential health impacts of smoking. These health effects are not some newfound knowledge and the firms were well aware of the dangers of smoking. However, rather than tell employees that smoking was detrimental to their health and that it may increase the dangers associated with work exposures, the firms did nothing. If an employee smoked, the firm felt that smoking was the cause of the disease, and **not** the work environment.

In the following letter to the ombudsman, Kelly, Stauffer's attorney, goes one step further in placing the responsibility on the employee:

On page 37 of Mr. Anderson's testimony, he states, under oath, that he could not quantify the amount of air 'particlets' [sic] he was exposed to as a Stauffer employee. He mentions only that he was exposed to unquantified levels of the following: silica dust, coke dust, nodule dust, rock dust, lime dust and asbestos... Mr. Anderson also states that he could not specify the concentrations of contaminants to which he believed he was allegedly exposed.<sup>66</sup>

According to this statement, employees—not employers— should purchase and use air measurement devices to provide data in the instance of a workers compensation claim. However, the opposite is true. The employer—not the employee—should be measuring the air to ensure the safety of employees and the public at large. Yet, according to Stauffer, Anderson—not the company—was at fault for not knowing the exact content and levels of the air he breathed for over 30 years.

### **Evidence That Stauffer Knew of Health Hazards at the Plant**

#### ***Stauffer's Industrial Hygienist Deposition***

There is evidence that Stauffer was aware of the potential for problems with the health of its employees. In a March 12, 1985 deposition, Robert Dale, Stauffer's regional industrial hygienist, gave the following testimony:

Q: When you mentioned earlier that one of the possible effects of over-exposure to crystalline silica is pulmonary fibrosis, do you know whether or not this is a result that happens because of an acute exposure, or is it a result that happens over a long period of being exposed to this substance?

A: To the best of my knowledge it's a chronic long-term exposure situation.

Q: And, Mr. Dale, is one of the reasons or the reason crystalline silica is listed as a substance of concern at the Tarpon Springs plant because it can cause pulmonary fibrosis?

A: I'd say a reason that it's listed as a substance of concern—one of them is that if an employee is exposed to an excessive level of it, it can cause pulmonary fibrosis.

Q: Okay. Are there any other of the substances of concern that, as far as you know, can cause pulmonary fibrosis?

A: The only other substance that I'm directly aware of, or those that we know of at the plant that could have some type of fibrotic effect on the lungs would be asbestos.

Q: Did you all do any testing for asbestosis?

A: Well, by the time I was at the plant, or by the time in fact that the industrial hygiene program really was geared up at the plant, asbestos was being handled in such a manner that there was little to no exposure to it. It was limited to using asbestos rope, which was handled and cut in a wet condition, which had minimal exposure. How it was handled and used before that, we have really no idea from a standpoint of monitoring, because monitoring, to the best of my knowledge, was not done previous to that.

Q: You all are aware the workers were exposed to asbestos, but you have no idea in what quantities and how often?

A: Well, I really up until just recently when, you know, I was becoming aware of this particular case and looking at some of the background information relating to it, I was not even aware how asbestos was handled prior to 1975 at the plant. There may be some people at the plant that have better knowledge than myself... I heard—well, two things. I had found information that indicated that, quote, loose asbestos they had at the plant was gone by 1974 and 1975. I did not know, based upon that, how it was used or handled, when it was at the plant or even if it was used at the plant; just that if there was some there, it was gone, and I had some information from someone else who worked at another plant as to how it had been used at the plant.<sup>190</sup>

The substances of concern were listed in a report, *Tarpon Springs Plant, Substances of Concern for Exposure Monitoring Listed by Approximate Priority*.<sup>186</sup>

### ***Six-Hundred Exposure Records at the Plant***

On October 5, 1982, Dale sent a memorandum to Jerry Harris, plant manager, regarding health records of personnel at the plant, stating the following:

#### **Introduction**

Approximately six hundred (600) personnel exposure records for the Tarpon Springs plant have been processed by the computer-assisted Environmental Information Center (EIC), following review and validation by the plant and industrial hygiene. Industrial hygiene

computer reports generated by EIC are attached. Review and analysis of the plant's exposure data base have been completed by industrial hygiene.

These personnel exposure data represent employee exposure conditions at the plant, prior to the current production shutdown. It is anticipated that some of these exposure data will be classified as historical due to significant changes in production conditions. These determinations will be made after the plant resumes production, following completion of follow-up monitoring. (7-26, p. 1)

The Tarpon Springs plant has validated personnel exposure monitoring records dating back to 1975. Since that time the plant has generated approximately 600 personnel exposure records which can be categorized as follows:

- 445 valid personnel exposure results (434 representing current exposure conditions and 11 representing historical data)
- 136 invalid personnel sample [sic].

All exposure records for the plant have been filed at the Environmental Information Center, **and will be retained for 75 years** [emphasis added](on micro fiche and in hard copy). Valid personnel exposure results are stored in the computer for ready access.<sup>196</sup>

The memorandum summarized current exposure conditions and indicated problems with P<sub>2</sub>O<sub>5</sub>, yellow phosphorus, and silica mixture. From a historical standpoint, exposure conditions indicated problems in quartz-T, total dust and silica mix-T (there was nothing to provide a perspective on the term *historical*).<sup>196</sup>

Therefore, the evidence shows that Stauffer was not only aware of the plant's health impact upon workers, but also documented the exposure and developed a system to ensure the documentation would be available for workers compensation and other claims for the next 75 years. NIOSH could retrieve these personnel exposure records for review. However, if NIOSH fails to take action on the health of former Stauffer workers, ATSDR could demand the production of the records via a 104(e) request under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Superfund Amendments and Reauthorization Act (SARA).



## **Stauffer Takes Steps to Ameliorate Work Conditions**

### ***Workers Wear Individual Monitors***

With the creation of OSHA, Stauffer became more careful and started to take some action concerning the safety of its workers. For example, in 1975, Stauffer began taking individual readings on worker exposure by giving workers a small, belt-worn monitor pump. Test results were recorded in the industrial hygiene files and in a computer at Stauffer's headquarters in Westport, Connecticut, and reported to management in a written report.<sup>36</sup> Before the use of individual meters, grab samples were taken with detection tubes.<sup>36</sup> These data became part of EIC records, which Stauffer will retain for 75 years.

Stauffer followed the threshold limit values (TLVs), which were established by the American Conference of Governmental Industrial Hygienists (ACGIH). OSHA had recommended levels called permissible exposure levels (PELs), but according to William Roberson, an industrial hygienist at the plant, because TLVs were more stringent, Stauffer elected to use ACGIH standards instead.<sup>36</sup> Some community members gave the ombudsman copies of the printouts from EIC's industrial hygiene program reports.<sup>213</sup> Harris' memorandum and the printouts were introduced by and became part of Roberson's deposition in the Anderson workers compensation claim. The memorandum stated that,

Our personnel monitoring samples were done largely on inert dust exposure, which included silica exposure, phosphorus exposure... We did some sampling on exposure to welding fumes, we sampled our painters for lead exposure and we did some sampling for phosphorus pentoxide exposure... Yes, we did the carbon monoxide with grab samples. For fluorides I did some area monitoring largely because the method that was available at that time for fluorides required that you use equipment that was very difficult to use. We did some sulphur dioxide sampling also on personnel monitoring. Asbestos also, but on a smaller scale because there was very little asbestos in the plant. Arsenic sampling was done one time because arsenic is an impurity that is found in the rock. So we had some questioning about it. Arsine, um-hum, the only arsine test we did was grab sampling with the detector tubes... It [silica] was always concurrent with the dust sampling. The allowable level for inert dust exposure is based on the amount of silica content. The more silica that's in the dust chemically the lower the exposure level goes by this equation you follow.<sup>36</sup>

According to Roberson, a respiratory program was initiated around 1980, and “Prior to 1980, respirators were always available for the employees from the time I started [in about 1972] there, but they were not always required by the employees. But they’ve always had respirators. Prior to 1980, it was pretty much up to the employee.”<sup>36</sup>

### ***Stauffer Samples for Phosphorus Pentoxide***

When asked if he ever did any testing when there was an “upset” condition of any gases or dusts, Roberson replied,

Yes, just before the plant shut down, I did some sampling in the phosphorus handling area for phosphorus pentoxide. The reason for the sampling is because the phosphorus handling area was being completely redesigned and rebuilt, and the new section was very nearly ready to come on at the time the plant shut down.

The older section that was still running, there was a—I don’t remember the specifics—but there were conditions there where we had a lot of visible emissions of phosphorus pentoxide ( $P_2O_5$ ). I ran samples there to make sure that the respirator equipment that we were providing these people was still adequate.

To the best of my knowledge those results, although they were higher than the threshold limit value, they were still well below the protection of the respirators.<sup>36</sup>

Roberson also said the following about the phosphorus handling area:

The older section had one ventilation device, and I don’t recall the name of the piece of equipment, but one ventilation device was out of order and had to be removed. And there was quite a bit of fugitive  $P_2O_5$  emissions in the area.  $P_2O_5$  is very easily—is very visible—it’s very easy to detect by sight. It’s white in color and very dense.<sup>36</sup>

### ***The 1977 Stauffer Industrial Hygienist Program Manual***

In 1977, Roberson prepared a manual for upper-level management of the plant describing the industrial hygiene program. The manual was expanded around 1980. Roberson stated that,

A: We had a policy there, it was a program called ‘Health Hazards Complications,’ whereby the employees had access to material safety data sheets. These are information sheets that manufacturers supply on products, they contain chemical information, first-aid information, toxicology type information.

And I assembled a looseleaf notebook that had a collection of these material safety data sheets for all chemicals that were handled in the production at the plant, and these were available to employees.

Q: When you say it was available, was it distributed to the employees or if they wanted to they could come by and pick it up?

A: No. There was a copy of the book in the personnel office and there was a copy in the laboratory, which was my own personal copy in my office. And there was a letter circulated that, you know, this was the program. This was our initial Employee-Right-to-Know Program and there was a letter circulated to the effect that it was there.<sup>36</sup>

In the following remarks, Roberson confirmed what many had thought was the truth:

Q: Of your own personal knowledge, do you know whether Stauffer Chemical Company had environmental control devices to either catch or warn of the existence of certain things in the atmosphere or the working environment of the employees out there?

A: At what stage of the game are you talking about?

Q: Well, let's take it from either last first or when you first started.

A: When I first started there was no controls whatsoever.

Q: What happened over time?

A: Over the period of 33 years they put in different collection equipment.

Q: Scrubbers?

A: Scrubbers.<sup>36</sup>

### ***The Health Hazard Communication Document***

On March 6, 1981, Harris, the plant manager, sent the following document, entitled "Health Hazard Communication" to employees:

Company policy requires that effective steps be taken to maintain a safe and healthful workplace, including the provision of effective employee information and training programs. Product Safety Information Sheets, placards, container labels, and substance/process safety manuals provide basic information for hazards communication programs addressing Stauffer products. In addition, Material Safety Data Sheets have been requested from our suppliers to broaden the scope of our programs.

Routine training is provided for all employees in the form of new employee orientation sessions, supervisory Safety Contacts, plant and departmental safety meetings, and On-the-Job Training. Special informational programs are also provided by Corporate Occupational Medicine, as the need arises.

The Company maintains a practice of making medical examination records available to the personal physician of any employee upon request; and providing summary exposure data to employees, in the interest of ensuring effective worker health programs. Further, the Company continues to provide exposure records to OSHA and others as required by properly issued standards.

Should any employee want safety and health information on substances encountered in this workplace, beyond what is covered in routine training sessions, contact the plant Personnel Department. They can provide assistance in the review of Safety Data Sheets and other safety and health-related documents.<sup>198</sup>

Community members—not Stauffer— provided the ombudsman with this document, which shows Stauffer’s belated effort to inform employees. Likewise, Stauffer provided no records indicating they had made efforts to keep employees informed *prior* to 1981, just before the plant closed.

Stauffer handed employees material safety data sheets and other safety information. Community members gave the ombudsman a copy of the Foreword and the Table of Contents of the manual. (The ombudsman did not receive the complete manual.)<sup>214</sup>

### ***Annual Physical Program***

In January 31, 1985, Harris gave a deposition in the Anderson case, indicating that Stauffer had an annual physical program, and that Dr. Hoger performed the examinations. Harris gave the following answers:

Q: Are you aware of any attempts that the company made to inform between encouraging employees to wear respirators and informing them of the potential consequences of their not wearing the respirators? I’m asking you if the company made any attempts as far as you know to inform them of potential consequences of not wearing the respirators?

A: I don’t know that we went to the employees and said, “Hey, if you don’t wear the respirator under dusty conditions that it will do such and such to your lungs.”

Q: Mr. Harris, are you aware of any citations that were issued to Stauffer Chemical Company by OSHA for excessive exposure to any of the substances of concern listed on this document?

A: Yes.

Q: All right. And when were the citations and what were they for as best you can remember?

A: I believe there were citations in '79 for dust exposure and phosphoric acid, I believe is the way the citation was written. However, their analytic procedures were incorrect for phosphoric acid.

Q: Okay. The citation for the dust exposure, the company didn't contest that?

A: I don't believe that was contested.<sup>37</sup>

Later in the deposition, Harris confirmed that the Stauffer plant in Silver Bow, Montana, produces phosphorus and that the equipment used there is similar to the equipment used in the Tarpon Springs operation.<sup>37</sup> In April 1979, NIOSH produced a health hazard evaluation determination on the Stauffer Silver Bow plant, stating that,

Overexposure to  $P_2O_5$  were found in all samples taken. Crystalline silica overexposures were found in three out of four samples that were taken.

A potential health hazard did exist at the time of the survey due to excessive airborne concentrations of  $P_2O_5$  and respirable crystalline silica.

Conclusions. Results of environmental data illustrate a potential health hazard existed during this evaluation.<sup>38</sup>

The report noted that, in 1975, Stauffer had a good respirator program in place at Silver Bow, and that during the survey, all workers used the respirators in required areas.<sup>38</sup> The report also noted that workers had only respirators as protection from  $P_2O_5$ .<sup>38</sup>

### ***The Case of Phossy Jaw***

Victor/Stauffer exercised considerable caution in one instance, for a condition called phossy jaw (necrosis of the bone), which dissolves the jaw bone. People working with phosphorus can

become subject to phossy jaw if they have dental problems. The fatal condition is caused by toxic phosphorus fumes. The whole side of the face turns green and then black, discharging foul-smelling pus, and the victim eventually dies.

Phossy jaw was brought to prominence by Catherine Booth, co-founder of the Salvation Army in England. Many women who spent 16-hour days making matches by dipping them into yellow phosphorus developed phossy jaw. Booth led a campaign against the use of yellow phosphorus, which was later replaced by harmless red phosphorus.

A dentist came to the plant to check employees for dental problems. Any problems were corrected immediately.<sup>208</sup>

### **OSHA Inspections Find Violations and Set Fines, 1972-1983**

The ombudsman contacted OSHA for their records of Stauffer inspections. OSHA was able to retrieve information from 1972 to 1983, which showed eight inspections, requested by the union. While OSHA could provide information via computer, the complete files had been destroyed through routine record keeping standards.<sup>215</sup> Following is a chronology of the OSHA inspections.

- **October 12, 1972** – Eight reported violations resulting in a \$140 fine. The standards violated were provided, but no key for translating the standard was included in the response.
- **March 28, 1975** – Unsatisfactory health conditions resulting in a \$140 fine. This inspection came one day after two employees were killed in a boiler pressure venting.
- **April 6, 1976** – Violations resulting in a \$140 fine.
- **August 22, 1978** – One violation, where the \$129 fine was waived, and three other violations resulting in a \$1,470 fine.
- **September 14, 1978** – Violations resulting in a \$129 fine.
- **September 25, 1978** – This followup inspection found additional violations resulting in a \$129 fine.

- **November 6, 1979.** Violations resulting in a \$129 fine.
- **February 11, 1980.** Violations resulting in a \$136 fine.

### **Stauffer Intends to Reopen the Plant**

Community members were concerned because Stauffer intended to reopen the plant in the mid to late 1980s. For this reason, MANASOTA-88, a non-profit environmental group, filed a petition with EPA for reconsideration of EPA's February 6, 1985 final rule concerning radionuclide emissions from elemental phosphorus plants. The March 1, 1985 petition states that,

MANASOTA-88 only recently learned that Stauffer Chemical Co. has advised local regulatory officials that it unquestionably intends to reopen its Tarpon Springs, Florida, elemental phosphorus plant. Specifically, Stauffer representatives advised Joyce Gibbs, the Director of the Pinellas County Division of Air Quality, and members of her staff that, 'it was not a matter of if Stauffer would reopen its Tarpon Springs facility, it was merely a matter of when'... It was also learned at this time that all Stauffer Chemical Company permits for its Tarpon Springs facility have at all times been kept up to date and validated for immediate use of the facility.<sup>216</sup>

The Tarpon Springs plant was never reopened. It was placed on the National Priorities list in 1994, and has now been dismantled.

## Chapter 8: Off-Site Slag

This chapter discusses issues related to the off-site slag in the Tarpon Springs area, and starts with some definitions which might be useful.

### Definitions

#### *Background*

Background, or naturally occurring radiation, varies by location in the United States and is measured in thousandths of rems, or millirems (mrems). The background for Tarpon Springs, Florida, is 60 mrems per year (mrem/yr), excluding the contribution from radon, and 160 mrem/yr, including radon.<sup>19</sup> As a matter of comparison, the background for Soda Springs, Idaho, is 105 mrem/yr,<sup>217</sup> and the background for Denver, Colorado, is 300 mrem/yr, including radon.<sup>19</sup>

#### *Radiation*

Some atoms, known as radionuclides, are unstable or radioactive. Radionuclides undergo a spontaneous decay process and emit one or more types of radiation until they reach a stable form. Natural radioactive atoms in the earth—primarily uranium, thorium, radium, radon, and potassium—and cosmic rays from outer space immerse the earth in fluctuating amounts of radiation at all times. In addition to natural sources of radiation, people are exposed to manufactured sources of radiation from medical sources, consumer goods, nuclear power plants, and nuclear weapons testing fallouts. Following are the three types of radiation.

- **Alpha radiation** consists of large particles. These particles are stopped easily and cannot penetrate even the outer layer of the skin.
- **Beta radiation** consists of smaller particles called electrons. These particles can penetrate the skin, but can be stopped by light materials such as paper or aluminum.
- **Gamma radiation** consists of electromagnetic waves, not particles. Gamma radiation can penetrate the skin and even travel through the body. Thick layers of materials, like concrete or lead, are needed to stop gamma rays.<sup>217</sup>



## ***Slag***

When elemental phosphorus is produced, it is removed from a mixture of phosphate ore, using silica and coke. The largest remaining by-product of elemental phosphorus is a lava-like rock known as “slag.” Primarily a compound of calcium and silica, slag also contains small quantities of uranium and radium. Because these last two elements are naturally present in the phosphate ore, the slag emits very low levels of gamma radiation (a type of radiation, similar to medical x-rays).

Historically, slag has been used extensively for construction processes as aggregate in concrete and asphalt, roadbed fill, backfill, and railroad ballast. From the 1950s to the early 1970s, slag was used in concrete poured for some basements and building foundations.<sup>218</sup>

## **ATSDR Investigates Site in 1998**

### ***ATSDR Receives Petition***

In February 1998, ATSDR received a petition from a Tarpon Springs resident to investigate health problems which might be associated with exposure to slag materials used in residential areas. ATSDR responded to the petition request. EPA Region IV also asked ATSDR to (1) review sampling data taken at several properties near the site, (2) review chemical and radiological sampling data of residential slag, (3) evaluate exposure scenarios, (4) provide radiological dose estimates, and (5) make recommendations for the protection of public health.<sup>19</sup>

### ***ATSDR Staff Meet Residents and Tour the Site***

In May 1998, ATSDR staff visited Tarpon Springs to address questions from residents and to gather information. ATSDR and EPA Region IV personnel also visited several properties in Tarpon Springs and Holiday, and saw the Stauffer site from the site boundary on the Anclote River. During a boat tour, ATSDR and EPA staff were shown where slag from the site was used to fill in an inlet on the site property.<sup>19</sup>

In August 1998, EPA Region IV personnel and staff from EPA's National Air and Radiation Environmental Laboratory in Montgomery, Alabama, took samples of building materials and roads and performed radiological surveys of several surrounding properties.<sup>19</sup>

### ***ATSDR's Addendum to the Public Health Assessment***

In 1999, ATSDR wrote an addendum to the public health assessment (PHA) of the site, which provided the following conclusions, recommendation, and public health action plan:

#### **Conclusions**

1. Phosphate slag from the Stauffer Chemical Superfund site reportedly has been used as concrete aggregate in homes, roads and roadbeds in the Tarpon Springs and Holiday, Florida, vicinity.
2. Although there is elevated background radiation from radium-containing slag and aggregate, the total background dose to a maximally exposed child in residence #1 is roughly the national average background dose of 300 mrems per year.
3. Annual background dose contribution from building materials to the maximally exposed child in residence #1 does not exceed the NCRP's recommended limit of 500 mrems per year.
4. Phosphate slag at sampled vicinity properties does not appear to contain sufficient leachable heavy metals to represent a public health hazard, based on current medical, epidemiological and toxicological information.
5. Combined exposures from driveways and roads containing phosphate slag are not a health threat.

#### **Recommendation**

The ATSDR recommends that public health education be provided to help the public better understand that there is currently no general public health hazard posed by the phosphate slag and to provide information to community members on the environmental health effects presented in the Stauffer Chemical Vicinity Properties public health assessment addendum.

#### **Public Health Action Plan**

The public health action plan for the Stauffer Chemical Vicinity Properties contains a description of actions to be taken by the Agency for Toxic Substances and Disease Registry (ATSDR) and other government agencies at and in the vicinity of the site after the completion of this public health assessment. The purpose of this Public Health Action Plan is to ensure that this public health assessment not only identifies public health hazards but

also provides a plan of action designed to mitigate and prevent adverse human health effects resulting from exposure to hazardous substances in the environment.

Upon request from the public, the Florida Department of Health (FDOH) will develop and implement an environmental health education program to help community members understand the potential for past exposure and to provide information on assessing any adverse health occurrences that might be related to phosphate slag.

### **Reactions to the Addendum**

Community members were upset with the conclusions of the draft and the final version of the addendum.

#### ***Pi-Pa-Tag Considers Addendum Worse than Previous Document***

Among the most vocal was Pi-Pa-Tag, Inc, one of the parties which requested the ombudsman's inquiry.<sup>1</sup> Pi-Pa-Tag wrote the following:

#### **Draft Public Health Assessment Seriously Flawed**

On March 7, 1999, the Agency for Toxic Substances and Disease Registry (ATSDR) issued the Draft of a Public Health Assessment (PHA), describing the results of their investigation into health problems that might be associated with exposure to slag materials removed from Stauffer Chemical Superfund Site and used in roads, driveways and house foundations in the surrounding residential areas. The Draft of this Public Health Assessment was released for a Public Comment Period; comments received were to be considered and responded to in the Final Version of the PHA.

The original Draft was seriously flawed, and highly disputed by most community members who took the time to read and respond to it. Standards supposedly established to ensure safety to members of the community were not always applied, and, even when acknowledged, they were then ignored in the PHA Conclusions. The Draft basically concluded that there were no health threats from exposure to either ionizing radiation or heavy metals. In spite of this, and because of the particularly high levels of ionizing gamma radiation found at one specific residence (which exceeded both National and International Exposure Recommendations), they noted that the people in that house might want to 'minimize their potential health risk' by spending less time in the more radioactive sections of their home.

#### **Final Public Health Assessment Even Worse**

The Final Version of the PHA was released on August 6, 1999, and included excerpts from public comments ATSDR received, as well as their responses to them.

The Public Comment Section proved to be extremely curious.

There were eighteen public comments included. The last twelve of the comments were taken from two specific letters (one from Pi-Pa-Tag and one from the Technical Advisor, Kevin Pegg, Ph.D.), and provided critical comments concerning specific parts of the Draft, including its Conclusions and Recommendations.

The first six 'public comments,' however, were very different from the last twelve. They were uniquely complimentary and supportive of the report. In addition, they went on to suggest changes that ATSDR had the effect of weakening the report. The comments offered a rationale whereby ATSDR could even drop the recommendation that the family in 'Residence # 1 ' might want to limit their exposure to radiation in the hot sections of their home.

Local residents were amazed at the final draft of the document. The original draft report had been unacceptable, as residents believed it did not honestly deal with potential dangers to residents. Then, after receiving comments from the community, ATSDR had issued a Final Version that residents believed to be even less protective.

It appeared that most comments from community members were simply dismissed. However, ATSDR made changes recommended in comments appearing to be from an individual who seemed to have gone to a great deal of effort to research the available literature, offering suggestions as to how the standards could be reinterpreted in a way that would allow ATSDR to deny any possible health risks, even to the children living in the home with the highest radioactive exposure.

On September 3, 1999, under the Freedom of Information Act (FOIA), Pi-Pa-Tag requested that copies of all public comments pertaining to this PHA be sent to them. The package was received on October 31, 1999. This information provided us with a surprising revelation. The 'public comments' which so helpfully assisted ATSDR in denying that there were any potential health risks to anyone (including children) from exposure to contaminants removed from the Stauffer Chemical Superfund Site and distributed throughout in the community *were submitted by Michael Kelly, Attorney for Stauffer Management Company/Zeneca. They were written by Jerome D. Guidry, President of Perigree Technical Services.* Many people in the community remember Mr. Guidry as the man hired by Stauffer Management Company (SMC) to participate in the EPA Availability Sessions at the Tarpon Springs Public Library in September 1997. He was the person, who, with a straight face, stated that it was safer to eat phosphate slag than to eat peanut butter.

### ***The Issue of Background Levels***

It is believed that the national and international standards Pi-Pa-Tag alleged have been exceeded are the International Commission on Radiological Protection measurement Publication No. 60.

However, these standards specifically exclude background levels, and building materials are considered background. This publication is primarily intended for the exposure of workers and the public from operations, not background levels.<sup>1</sup> Pi-Pa-Tag may also be referring to 10 C.F.R. Part 20, which limits the public dose to 100 mrem/yr above background. But, once again, building materials are part of background level.<sup>1</sup>

Pi-Pa-Tag also felt that the final version of the addendum was less protective than the draft. The author of the addendum stated that one reason the document may appear less protective is that during outside ATSDR peer-review, one reviewer discovered that building materials had not been included in the background levels.<sup>219</sup>

### **The Soda Springs, Idaho, Site Comparison**

Others in the community sought to compare the Stauffer site with another Superfund site in Soda Springs, Idaho, owned by Monsanto Chemical Company.<sup>220</sup> The site is similar to Stauffer because it processed locally mined phosphate ore to produce elemental phosphorus, resulting in slag, which was then used as aggregate in buildings and roadbeds.<sup>221</sup>

### ***1992 ATSDR Preliminary PHA Finds Site a Public Health Hazard***

In March 1992, ATSDR produced a preliminary PHA for the Soda Springs site. The preliminary PHA—which was never turned into a PHA—stated the following:

#### **Conclusions**

From the information reviewed, this site is judged to be a public health hazard as a result of public exposure to hazardous substances (**radioactive slags**) [emphasis added] that may result in adverse health effects. ATSDR recognizes that the problem of radioactive slag use in the area is not limited to the subject site of this interim preliminary health assessment. The Agency also realizes that there is considerable controversy regarding the quality of the data reviewed for our earlier related health consultation cited in this document. However, until ATSDR has refined information regarding the potential radiation hazard discussed in this assessment, there is no way to accurately evaluate the need for additional health followup activities beyond the recommendations of this report. Consequently, in the interest of public health protection, the ATSDR must choose the conservative classification of the site as a public health hazard. ATSDR believes that this classification justifies

further evaluation of residential areas for possible health impacts from radiation and therefore will help to resolve this information gap in a manner that best protects public health. It should also be recognized, however, that as an interim preliminary health assessment, this classification is subject to change pending the receipt of additional pertinent information.

Also, as described above, exposure to a number of inorganic compounds may have occurred or may still occur through the ingestion and inhalation of or dermal contact with contaminated groundwater or plant air/site fugitive dust emissions. There were very limited community health concerns which, combined with limited exposure characterization data, did not allow meaningful health outcome evaluation.

The lack of actual off-site air characterization data precludes further analysis of the impact on public health through this medium. Similarly, lack of data characterizing irrigation water or concentrations of metals in crops precludes further examination of the food chain. Monsanto reports to have data that shows no detectable effect on receiving water used for irrigation after receiving non-contact cooling water from their plant (see recommendation 4 below). Neither of these potential routes of exposure was noted as a public concern by State health officials contacted during the ATSDR site visit.

### **Recommendations**

1. Pending further radiation hazard characterization, in order to alleviate the potential for health effects resulting from the exposure to gamma radiation in the Soda Springs, Idaho, area, ATSDR recommends the following:
  - a. The use of slag for building material and any other construction purposes should stop immediately.
  - b. The city or State should repair roads and sidewalks in Soda Springs on an accelerated schedule.
  - c. Existing material in sidewalks, roadways, and building foundations should be removed during repairs and should not be incorporated into the new structures.
  - d. A more detailed radiological investigation should be carried out to identify those homes and areas of Soda Springs that have elevated radiation levels. Based on these results, the proper remediation action can be determined.
  - e. EPA should consider radiation exposures that would result from slag removal activities.
2. The existing monitoring well network should continue to be sampled, including the previously contaminated domestic well, to track the contaminated plume migration

and concentration. Being directly in the path of plume migration, the domestic well should serve as a particularly good indicator of off-site contamination. Sampling should continue until such time that a clear and statistically supportable conclusion can be drawn to show that the potential for contaminant migration from on-site to off-site areas is no longer significant. In response to the public comment period for this interim preliminary health assessment, Monsanto reports that such sampling is continuing.

3. Several domestic drinking water wells upgradient and downgradient from the site should be identified for annual sampling to determine if differences in water quality are notable.
4. Irrigation water with and without the cooling water effluent should be analyzed to assess if the concentrations of the metals of concern differ significantly. If the difference is significant, crop plant uptake and concentration of these metals should be investigated to determine if the food chain has been affected. In response to the public comment period for this interim preliminary health assessment, Monsanto reports that they have conducted sampling of Soda Creek above and below their discharge and that there has been no detectable impact on the quality of the receiving water.
5. Monsanto should continue its efforts in evaluating the potential for impact from air emissions, including fugitive dusts, from its plant activities. In response to the public comment period for this interim preliminary health assessment, Monsanto reports that they are continuing to evaluate the potential for air impacts as recommended. They also report that they are improving in-plant controls to further reduce air emissions.
6. It is recommended that the State Department of Health closely monitor plausible health outcomes in residents of Soda Springs related to possible current and past exposure to radioactively contaminated slag, and other plant process emissions.
7. In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, the Monsanto Chemical Company site has been evaluated by the Health Activities Review Panel for appropriate followup health activities. Other than recommendation number six above, this site is not being considered for additional followup health activities at this time (See Public Health Actions below).
8. If future ATSDR evaluations indicate that a substantive completed exposure pathway exists or that the community has expressed specific health concerns, then the Agency will evaluate health outcome databases as a part of any future assessments for this site.

### **Public Health Actions**

As indicated in the above discussion, actions to respond to a number of these recommendations have already been undertaken by Monsanto. The ATSDR will reevaluate the need for possible additional followup health activities when additional information becomes available. Specifically, refined data characterizing the impacts of radiation contamination of slag are sought, as well as additional data on contaminated groundwater plume migration characteristics and trends, impacts on other domestic drinking water wells and irrigation waters, if any, and data to better characterize site air releases.<sup>221</sup>

### ***ATSDR Conducts Exposure Investigation in 1998***

In 1998, ATSDR conducted an exposure investigation in Soda Springs after receiving a petition from local residents, who were especially concerned about stack and fugitive emissions from local industries including Solutia (formerly Monsanto). Samples of surface soil, subsurface soil, and indoor dust were analyzed for chemicals known to be associated with industrial operations in the area.<sup>222</sup> The contaminants detected in soil and dust samples from four private residences near the Soda Springs Industrial Park and from other publicly accessible areas were not at levels of health concern.<sup>222</sup>

### ***Graded Decisions Guidelines***

In September 1995, EPA asked for public comments regarding two documents relative to public health from exposure to phosphorus slag in Southeast Idaho. The first document, *Exposure Study Workplan*, identified the equipment and techniques that would be used in the program for South East Idaho residents who voluntarily participate in a study of individual exposure to radiation from slag. The second document, *Graded Decision Guidelines*, contained recommendations from the phosphorus slag technical work group to assist individuals in interpreting results from the exposure study.<sup>223</sup> The guidelines, based on international and national standards, are divided into the following three levels:<sup>223</sup>

- For individual **doses less than 100 mrem/yr above background levels**, no further action is recommended.
- For individual **doses between 100 mrem/yr above background levels and 500 mrem/yr, including natural background levels**, action should be considered to reduce exposure.



- For individual **doses exceeding 500 mrem/yr, including natural background levels,** action should be taken to reduce radiation doses. (Emphasis added).

The guidelines provide a workable means of reaching decisions regarding exposures to slag. The graded scale helps agencies to apply rules consistently across a country with a wide variety of background levels. Without workable, flexible guidelines, responsible parties might be required to clean hazardous waste sites to levels below the natural background. In fact, without such guidelines, it is conceivable that entire states and/or cities could require cleanup.

### *Inconsistencies in Site Assessments*

A comparison of the Florida and Idaho sites reveals inconsistencies in ATSDR evaluations. The off-site slag is considered hazardous in Soda Springs, but not in Tarpon Springs. The off-site slag is not defined as a part of the site in Tarpon Springs or in Soda Springs. Wallace Reed, the remedial project manager for the Soda Springs site, told the ombudsman for EPA Region X that “The slag pile on Monsanto property is part of the site. The off-site slag is not part of the site and is not mentioned in the Record of Decision.” Because the off-site slag is not a part of either site, it is difficult to understand how two different conclusions could be reached.

The real problem with comparing the sites is that the Soda Springs preliminary PHA comments on an EPA risk assessment (using only EPA risk numbers), and does not provide values and assumptions to help reconstruct risk factors. In the Tarpon Springs addendum, estimated exposure doses are given and the risk assessment is not being considered. Therefore, before a true comparison can be made, all the available data from the off-site slag at both sites would need to be compared. Although the 1992 Soda Springs PHA was preliminary, ATSDR has never revised or updated the document and its conclusions. Whatever the final outcome, ATSDR must be consistent about its determinations and the manner in which they are presented to the public.

## **Additional Citizen Concerns**

### ***Questionable Data***

Some of the confusion and conflict regarding the off-site slag issue began with FDOH's effort to develop a report relating to the slag and its health impacts. The public's perception was also enhanced by newspaper coverage of sampling by George Hueler, who allegedly used a "rusty" shovel to retrieve samples. Bruce Tuovila, of FDOH, was planning to use data from these samples for his health consultation. Mike Flanery, of the Pinellas County Department of Health, questioned the need for the report, and asked that no report be developed until EPA had conducted tests.<sup>224</sup> FDOH ultimately dropped the report because of questionable data.<sup>225</sup>

### ***Adverse Health Outcomes from the Slag***

Citizens have additional concerns and questions regarding adverse health outcomes from the slag, because levels of the on- and off-site slag are similar. The record of decision for the site concluded that 4 four out of 100 adults would die from a 24-year exposure and one out 10,000 children would die from a 6-year exposure. Bruce Dickey, a Tarpon Springs resident, wrote that "There are certainly adverse health outcomes."<sup>226</sup> Dickey also provided comments to the EPA Hazardous Waste ombudsman, with attachments, including test results from samples taken from road base materials from Holiday Estates and a petition expressing concern for the radioactive roads.<sup>220</sup>

In his letter to the EPA ombudsman regarding his Exhibit B, Dickey stated that "The maximum gamma radiation levels there [Soda Springs] were 65  $\mu\text{r/hr}$ , compared with 190  $\mu\text{r/hr}$  found in the streets of Holiday, Florida."<sup>220</sup> The ombudsman was unable to find either reading in the appropriate PHA and found no other evidence to support the readings.

Dickey also took issue with the following statement on page 7 of the addendum: "Phosphate slag is a naturally occurring radioactive material, not a man-made radioactive material." In the May 18, 1990 health consultation on Pocatello and Soda Springs, Idaho, Paul Charp, of ATSDR wrote that

“This includes man-made sources, such as slag but does not include exposures from medical procedures.”<sup>226</sup> Again, inconsistency in agency materials confuse the public.

In a comment to the ATSDR ombudsman, Charlene Hoog wrote that “Any radiation level on the Stauffer Superfund site in Tarpon Springs is unacceptable.”<sup>227</sup>

### ***Radon***

What about Radon? Radon is an invisible, odorless gas and a natural part of the environment—not man made—found in all areas of the United States. Slag does not release significant quantities of radon. Typically, radon occurs in higher doses in areas with naturally occurring uranium in the soil. Members of the Technical Work Group believe that risk from radon, although not associated with phosphorus slag, should be taken into consideration when evaluating overall risks from radiation and risk reduction strategies.<sup>223</sup>

### **Ombudsman’s Response Relating to the Addendum**

In its request to the ombudsman for an inquiry, Pi-Pa-Tag added three questions relating to the addendum. Following are the questions, in bold, with the ombudsman’s findings.

**Why would ATSDR choose to delete almost the entire page entitled “Special Considerations of Women and Children?” This page explained why women of child-bearing age and their children represent a particularly vulnerable part of the population, and need special protection. In terms of public health and safety, it was an extremely relevant and valuable part of the original report. Its absence weakened an already compromised report.**<sup>1</sup>

The author of the addendum told the ombudsman that the language deleted in the final report was “boiler plate,” not directly relevant to the Tarpon Springs matter. He further stated that issues relating to children and women of child-bearing age are discussed within the body of the report.<sup>219</sup>

**Why would ATSDR accept comments from an attorney representing SMC and an “expert” hired by SMC and include them as “Public Comments,” without disclosing that they had been received, not from members of the community, but from people in the employment of Stauffer Management Company?**

When matters are published for public comment, anyone (even non-stakeholders) may comment on the document. The responsible party (RP) is a stakeholder and is entitled to comment, either directly, through a representative, or a contractor. After the closing date for comments, comments from all the sources are considered.

In the ATSDR glossary of terms, “public comment” is defined as

An opportunity for the general public to comment on Agency findings or proposed activities. The public health assessment process, for example, includes opportunity for public comment as the last step in the draft phase. The purpose of this activity is to (1) provide the public, particularly the community associated with a site, the opportunity to comment on the public health findings contained in the public health assessment, (2) evaluate whether the community health concerns have been adequately addressed, and (3) provide ATSDR with additional information.

While the general intent of a public comment period is to ensure an opportunity for community participation, an RP may participate. The RP, whether desirable or not, is still a part of the community. When a corporation is granted corporation status by the Secretary of State, the firm has the general rights of a person. Therefore, ATSDR must consider the comments received, regardless of the source.

No requirement specifies that the identity of commenters must be published. In fact, matters of privacy should be considered. However, in instances where comments are received from or on-behalf of the RP, there is no restriction or requirement on identifying the commenter.

**Furthermore, why would ATSDR incorporate “suggestions” from the Polluter into the body of the Public Health Assessment, using them as the rationale for further degrading an already unacceptable report?**

As stated in response to the previous question, the RP is entitled to submit comments. The author of the PHA is not required to include or exclude a comment in the final product, only to exercise professional judgment in deciding which comments to include.

## Chapter 9: Recommendations

Following are the ombudsman's recommendations regarding the ATSDR response to the public health issues relating to the Stauffer Chemical Company site in Tarpon Springs, Florida.

1. ATSDR should develop a new public health assessment (PHA) or other appropriate public health activity, which will:
  - Review data which was available but not reviewed or considered in the previous PHA, addendum, and health consultations.
  - Consider all new data gathered and being gathered by EPA.
  - Include data from tests which ATSDR would specifically request EPA to conduct on private wells in Pinellas and Pasco Counties, following a firm determination of groundwater flow. The request should be for tests on an ample number of wells to ascertain levels of contaminants and public health impact on water users. Test protocols should ensure consideration of the short half-life of some contaminants. While much data exists regarding Pinellas County private wells, a survey of wells in nearby Pasco County is essential.
  - Include data from tests which ATSDR would specifically request EPA to conduct regarding asbestos on- and off-site (in air, slag, and soil). Friable slag would be a major concern in requesting asbestos tests.
  - Be peer reviewed, prior to final release, to ensure that questions or issues surrounding the science are answered.
  - Be placed on a priority track within ATSDR.
  - Be reviewed by the Division of Toxicology for consistency with ATSDR minimal risk levels guidance for contaminants of concern.
  - Actively seek input from local citizens and other stakeholders, to include public meetings in the Tarpon Springs area.

- Draw scientific conclusions and comparisons based upon background samples from off-site, and outside the range of likely heavy contamination. Previous background samples were taken from the northeast corner of the site.
  - Seek to provide answers to the public regarding past exposure in addition to present and future risks.
  - Seek specialized assistance from EPA to perform aerial radiological surveys, ground measurements, and pressurized ionization chamber readings similar to those performed in Pocatello and Soda Springs, Idaho. In those studies, the cities were divided into radial sections centered upon the phosphorus plant.
2. ATSDR should review the addendum for off-site slag to ensure conclusions are consistent with findings at other, similar sites. The *Graded Decision Guidelines* should be applied to the issue of off-site slag.
3. ATSDR should conduct additional health education projects in the area related to both the site and the off-site slag. The new health education projects would be based upon all data, including new test results and would:
- Be centered on all contaminants of concern, including asbestos.
  - Include new grand rounds to educate local physicians regarding known or potential environmental health impacts from the site.
  - Include new, accurate flyer(s) for former workers and members of the public. The flyer(s) would discuss contaminants of concern, as well as past, present, and future potential health impact resulting from living near or working at the site. New educational materials should be developed and feature materials in Greek for the large Greek population in the area.

4. ATSDR should conduct or fund a study by a reputable investigator, of a cohort of children who attended Gulfside elementary school during the period subsequent to the school's opening, and prior to the Stauffer Chemical plant closing. Asbestos should be a contaminant of concern in this study.
5. ATSDR management should *vigorously* seek followup action by the National Institute for Occupational Safety and Health (NIOSH) and/or the Occupational Safety and Health Administration (OSHA) to investigate health problems of former workers at the facility. The 1993 preliminary PHA recommended that NIOSH and OSHA consider conducting medical monitoring, but no action has ever been taken. If OSHA and/or NIOSH fail to initiate action, ATSDR should consider the health of the former workers to be a public health concern and, under the Superfund law, design and implement appropriate medical follow-up for former workers.
6. Pursuant to 42 U.S.C Section 9604(d)(1)(A) and (B) and (2), ATSDR management should seek to develop a greater means of controlling the flow of monies from federal coffers to state partners. At present, the agency uses Program Announcement 607 to fund cooperative agreements with states. These agreements have many voids, leaving the agency with little to no power to recover monies or take action for failure to perform, or failure to respond to requests for information from the agency. Immediate action must be taken to improve the control of funds distributed through cooperative agreements. Consideration should be given to the use of contracts for greater ability to outline requirements and quality of work product.

Consideration should be given to the development of a new program announcement that:

- (a) Addresses the potential need to obtain information/data from state partners promptly.
- (b) Includes the ability to terminate funding for poor or non-performance.



(c) Should, at a minimum, include the requirements of 45 C.F.R. Part 92 within cooperative agreements.

7. ATSDR management should review the process by which PHAs and health consultations produced by state partners are approved as final. A quality control system should be activated to ensure not only the application of proper science, but the gathering of ample, and appropriate data for consideration. Annual quality audits of randomly selected documents should be considered. Audits would include (a) visiting the site and the partner, and (b) reviewing the data upon which the PHA or health consultation was based and the science used to reach conclusions.
8. Pursuant to 42 U.S.C Section 9604 (d)(2), ATSDR management should consider a means of recovering a portion of the expenses of producing a new Stauffer PHA from the State of Florida. The new document would be a mix of data considered by the state partner, data not considered by the partner, and new data which was not available to the partner. ATSDR management should consider the facts, and after discussions with the state, implement a repayment strategy. Because Tarpon Springs citizens have expressed concern about the state's PHA and the costs associated with developing a new document, this decision should be made public.
9. Using the site team concept, ATSDR should ensure the ability of citizens to participate in and provide input into the process of health assessment, whether the product is to be developed by the agency of a state partner. It is important that the public be heard and have input into all agency processes, documents, and activities.
10. ATSDR management should consider hiring civil investigators to assist health scientists in gathering information for the preparation of documents on NPL sites. Valuable information is often available in courts, newspapers, archives, and other facilities which should be considered in the development of PHAs and/or health consultations. Health scientists have

little time for or background to seek or locate such information, yet the information may be critical to the determination(s) regarding past health effects. If health scientists who spend their time considering information and those more familiar with gathering information work together, better materials would result and the economies of time and money would be better served.

Placement of civil investigators within ATSDR would be critical. ATSDR would be better served if the investigators were located so that all divisions could have easy access to their services. Placement within a specific operational division could connote ownership and could thus reduce the availability to the staffs of the non-owning divisions.

11. ATSDR and EPA should conduct a joint investigation to determine whether Victor/Stauffer or any other owners of the facility sought to process “yellow cake” from the slag at Stauffer. To prove or disprove the allegations regarding yellow cake could impact the conclusions and recommendations regarding public health and the medical monitoring of former employees.
12. ATSDR and EPA should conduct a joint investigation determine the purpose and the impact of military maneuvers at the Stauffer site. Specifically, the agencies should try to determine any health consequences resulting from the military activity. Results from the investigation should be made available to the public.

## Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
ATSDR	Agency for Toxic Substances and Disease Registry
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CWS	Chemical Warfare Service
DOE	Department of Energy
DOT	Department of Transportation
EIC	Environmental Information Center
EPA	Environmental Protection Agency
FDEP	Florida Department of Environmental Protection
FDER	Florida Department of Environmental Regulation
FDHRS	Florida Department of Health and Rehabilitative Services
FDOH	Florida Department of Health
HARP	Health Activities Recommendation Panel
HC	Health consultation
ICI	Imperial Chemical Industries
MCL	Maximum contaminant level
NIOSH	National Institute for Occupational Safety and Health
NPL	National Priorities List
OGC	Office of the General Counsel
OPOM	Office of Program Operations and Management (at ATSDR)
OSHA	Occupational Safety and Health Administration
PCPHU	Pinellas County Public Health Unit
PHA	Public health assessment
PLM	Polarized light microscopy
PSI	Pollutant standard index

ROD	Record of Decision
RP	Responsible party
SARA	Superfund Amendments and Reauthorization Act
SO <sub>2</sub>	Sulfur dioxide
SSA	Social Security Administration
SWFWMD	Southwest Florida Water Management District
TSP	Total suspended particulate
USGS	United States Geological Survey

## References

**Note:** Unless otherwise noted, references pertain to the Victor/Stauffer Chemical Company site (Victor or Stauffer) in Tarpon Springs, Florida.

1. Pi-Pa-Tag, Inc. Letter to ATSDR ombudsman from Heather Malinowski concerning Stauffer. Tarpon Springs, FL. February 11, 2000.
2. Congress of the United States. Letter to ATSDR ombudsman from Michael Bilirakis concerning Stauffer. Washington, DC. April 18, 2000.
3. Complaint, Mickler v Victor, 1554. US District Court, Southern District of Florida; Tampa Division (1948).
4. Agency for Toxic Substances and Disease Registry (ATSDR). Preliminary public health assessment for Stauffer. Atlanta: US Department of Health and Human Services; 1993.
5. City of Tarpon Springs. Charter. Appendix A: Corporate limits.
6. Deposition of Claypool in the case of Mickler v Victor, 1554. US District Court, Southern District of Florida; Tampa Division (1948). January 25, 1950.
7. Victor Chemical nears completion. Tarpon Springs Leader. September 18, 1947.
8. Victor Chemical starts 24 hour operations. Tarpon Springs Leader. November 20, 1947.
9. Deposition of Crider in the case of Mickler v Victor, 1554. US District Court, Southern District of Florida; Tampa Division (1948). July 13, 1948.
10. Kelly M. Facsimile to ATSDR ombudsman concerning Stauffer's corporate structure. Wilmington, DE. November 2, 2000.
11. Environmental Protection Agency (EPA) Region IV. Final baseline risk assessment parts A and B for Stauffer. Atlanta: EPA; May 18, 1994.
12. Weston. Final site remedial investigation report of Stauffer. West Chester, PA; December 1993.
13. ATSDR. Health consultation concerning Stauffer site. Atlanta: US Department of Health and Human Services; December 20, 1995.
14. ———. Health consultation concerning Gulfside elementary school. Atlanta: US Department of Health and Human Services; July 22, 1998.

15. Black and Veatch Special Projects. Data evaluation report of Stauffer. Atlanta, GA; February 17, 2000.
16. EPA Region IV. Record of decision. The decision summary operable unit 1. of Stauffer. Atlanta, GA: EPA; July 2, 1998.
17. ATSDR. Memorandum to Carl Blair from Kenneth Orloff concerning the Stauffer health consultation. Atlanta, GA. January 21, 1994.
18. Florida Department of Health (FDOH). Memorandum to Sharon Heber from Raul Quimbo concerning Stauffer. Tallahassee, FL. April 1, 1999.
19. ATSDR. Public health assessment addendum for Stauffer. Atlanta: US Department of Health and Human Services; 1999.
20. ———. Health consultation concerning Tarpon Springs private wells. Atlanta: US Department of Health and Human Services; August 13, 1999.
21. ———. Worker safety announcement for Stauffer. Atlanta: US Department of Health and Human Services; 1996.
22. FDOH. Letter to healthcare professionals from Bruce Tuovila. Tallahassee, FL.
23. ———. Memorandum to ATSDR ombudsman from Randy Merchant concerning the list of health complaints from former Stauffer employees. Tallahassee, FL. September 27, 2000.
24. ———. Public information update concerning the Stauffer site.
25. ———. Letter to ATSDR ombudsman from Randall Merchant concerning FDOH contract with Dr. Chris Teaf at Stauffer. Tallahassee, FL. May 5, 2000.
26. ATSDR. Health consultation concerning Gulfside elementary school. Atlanta: US Department of Health and Human Services; May 1998.
27. Deposition of Turnpaw in the case of Mickler v Victor, 1554. US District Court, Southern District of Florida; Tampa Division (1948). July 14, 1948.
28. Pinellas County Health Department. Letter to Paul Haney from John McDonald concerning the investigation of Stauffer. Tarpon Springs, FL. May 17, 1948.
29. City of Tarpon Springs. Letter to Joe McCreary from Archie Clement concerning Victor. Tarpon Springs, FL. June 4, 1948.
30. Florida Agricultural Department. Letter to Joe McCreary from JJ Taylor concerning vegetation samples analysis. Tallahassee, FL. June 14, 1948.

31. Pinellas County Health Department. Letter to Paul Haney from John McDonald concerning water analysis at Tarpon Springs. Tarpon Springs, FL. June 14, 1948.
32. Division of Industrial Hygiene. Letter to Paul Haney from John McDonald concerning nuisance at Victor. December 14, 1948.
33. Board of County Commissioners of Pinellas County. Letter to Mary Mosley from William Davis concerning health issues at Stauffer. Clearwater, FL. December 5, 1995.
34. Gross E, Nohlgren S. Ex-workers hold Stauffer liable. St Petersburg Times on line. May 12, 1998.
35. EPA. Field inspection report of Stauffer. Washington, DC: EPA, Division of Stationary Source Enforcement; December 1979.
36. Deposition of Roberson in the case of Anderson v Stauffer, 428-30-1697. State of Florida, Department of Labor and Employment Security; Division of Worker's Compensation; Tallahassee, FL (1987). January 8, 1985.
37. Deposition of Harris in the case of Anderson v Stauffer, 428-30-1697. State of Florida, Department of Labor and Employment Security; Division of Worker's Compensation; Tallahassee, FL (1987). January 31, 1985.
38. US Department of Health, Education, and Welfare. Health hazard determination of Stauffer Chemical Company, Silver Bow, Montana. Cincinnati: US Department of Health, Education, and Welfare; April 1979.
39. Deposition of Anderson in the case of Anderson v Stauffer, 428-30-1697. State of Florida, Department of Labor and Employment Security; Division of Worker's Compensation; Tallahassee, FL (1987). January 31, 1985.
40. Pinellas County Air and Water Division. Letter to Jacob Stowers from Joyce Gibbs concerning the summary of Stauffer. Clearwater, FL. March 9, 1980.
41. Board of County Commissioners of Pinellas County. Letter to David Puchaty from Stephen Peacock concerning fugitive particulate problems at Stauffer. Clearwater, FL. August 13, 1979.
42. ATSDR Ombudsman. Record of interview with Dan Flaherty. Tarpon Springs, FL. April 18, 2000.
43. Walsh A. Toxic legacy. St Petersburg Times. April 21, 1997.
44. Florida Department of Environmental Regulation (FDER). Letter to Jerry Harris from David Puchaty concerning warning notice #52-79-10-168, issued to Stauffer. Tampa, FL. October 11, 1979.

45. Stauffer. Letter to David Puchaty from Jerry Harris concerning the warning notice issued to Stauffer. Tarpon Springs, FL. January 28, 1980.
46. Petitioner for Stauffer site. Petition letter to the Pinellas County Air and Water Quality Division. Tarpon Springs, FL. March 29, 1980.
47. Pinellas County Air and Water Quality Division. Memorandum to files from Peter Hessling concerning the P<sub>2</sub>O<sub>5</sub> emission episode of April 17, 1980 at Stauffer. Clearwater, FL. April 18, 1980.
48. Stauffer. Letter to Craig McArthur from Jerry Harris concerning the P<sub>2</sub>O<sub>5</sub> emission episode of April 17, 1980 at Stauffer. Tarpon Springs, FL. May 8, 1980.
49. Board of County Commissioners of Pinellas County. Letter to David Puchaty from Joyce Gibbs concerning analytical results from filter samples from Stauffer. Clearwater, FL. February 13, 1980.
50. IIT Research Institute. Letter to Wayne Martin from Jean Graf concerning the microscopical analysis of 21 filter samples from Stauffer. Chicago, IL. October 12, 1979.
51. ———. Letter to Wayne Martin from Jean Graf concerning the microscopical analysis of 21 filter samples from Stauffer. Chicago, IL. November 2, 1979.
52. Pinellas County Air and Water Quality Division. Memorandum to Jacob Stowers from Joyce Gibbs concerning the microscopic analysis of Tarpon Springs TSP filters. Clearwater, FL. February 25, 1980.
53. FDER. Interoffice memorandum to Steve Smallwood from Douglas Bramlett concerning the August 19, 1981 inspection report of Stauffer. Tampa, FL. August 25, 1981.
54. FDER. Interoffice memorandum to Dave Puchaty from Larry George concerning the North Pinellas County SO<sub>2</sub> ambient air violations. Tampa, FL. October 23, 1978.
55. The average and the high 1979 PSI values for Florida metropolitan areas.
56. Office of the General Counsel. Letter to Jerry Harris from Stephen Fox concerning the delayed compliance consent order for Stauffer. Tampa, FL. January 26, 1979.
57. ATSDR Ombudsman. Record of interview with Peter Hessling.
58. Board of County Commissioners of Pinellas County. Air quality 1983 annual report. Clearwater, FL; October 1984.
59. Chambers, PA. Letter to Bruce Tuovila concerning name withheld, a former worker at Stauffer. St Petersburg, FL. December 2, 1997.



60. ATSDR Ombudsman. Record of interview with George McCall. August 2, 2000.
61. Stauffer. Letter to Harry Kern from CA Hendrickson concerning the operating permit for Stauffer. Tarpon Springs, FL. February 6, 1975.
62. Nutile T. Ruling disease injury industry cost Stauffer Chemical Company. Clearwater Times. March 5, 1987; section 1:1.
63. Deposition of Dunn in the case of Anderson v Stauffer, 428-30-1697. State of Florida, Department of Labor and Employment Security; Division of Worker's Compensation; Tallahassee, FL (1987). August 15, 1985.
64. Acosta H. Memorandum to files concerning Eugene Anderson's additional work history. April 9, 1986.
65. Kelly M. Letter to ATSDR ombudsman concerning Stauffer. Wilmington, DE. September 15, 2000.
66. Hearing. Anderson v Stauffer, 428-30-1697. State of Florida, Department of Labor and Employment Security; Division of Worker's Compensation; St Petersburg, FL (1987). November 25, 1986.
67. Zeneca. Letter to Maxwell Kimpson from FR McNeice concerning previous site activities at Stauffer. Wilmington, DE. March 14, 1997.
68. ATSDR Ombudsman. Record of interview with five former Stauffer employees. June 6, 2000.
69. California v Stauffer; BA 023527. Superior Court of the State of California for the County of Los Angeles. November 20, 1992.
70. Sample analysis of Stauffer Company at South Gate, CA.
71. Los Angeles County Department of Health Services. Sample and evidence log of Stauffer Chemical at South Gate, CA. Los Angeles: Department of Health Services; February 8, 1990.
72. Delta Environmental. Asbestos survey report of ICI/Stauffer. October 10, 1990.
73. Zeneca. Letter to William Denman from FR McNeice concerning demolition activities at Stauffer in 1991 and 1992. Wilmington, DE. November 9, 1995.
74. Asbestos Control Services. Waste shipment record. February 14, 1992.
75. FDOH. Memorandum to Maxwell Kimpson from Bruce Tuovila concerning the environmental sampling for asbestos and silica at Stauffer. Tallahassee, FL. May 2, 1997.

76. Parsons Engineering Science. Site-wide asbestos sampling report for Stauffer. Tampa: Parsons Engineering Science, Inc; July 1998.
77. EPA Region IV. Memorandum to Maxwell Kimpson from Caroline Robinson concerning asbestos air monitoring data review at Stauffer. Atlanta, GA.
78. EE and G. Baseline air monitoring at the Gulfside elementary school in Holiday, FL. Tampa: EE and G; Summer 1997.
79. FDER. Interoffice memorandum to Kirk Johnson from George Ellsworth concerning Stauffer. Tampa, FL. October 30, 1986.
80. ———. Letter to Jerry Harris from Kirk Johnson concerning groundwater monitoring at Stauffer. Tampa, FL. September 10, 1986.
81. Farley R. Report: Stauffer water may leak. St Petersburg Times online. April 23, 2000.
82. FDER. Interoffice memorandum to Harry Kerns from Sam Sahebzmanai concerning Stauffer's permit for discharge of phosy water. Tampa, FL. October 6, 1981.
83. Florida Department of Environmental Protection (FDEP). Craig Feeny, conversation record concerning John Gentry. February 13, 1987.
84. Newspaper article from the St Petersburg Times concerning Stauffer. June/July 1987.
85. Listing of addresses in Tarpon Springs.
86. FDOH. Memorandum to Andrew Reich from Wayne Wyatt concerning Stauffer off-site groundwater sampling. Clearwater, FL. September 5, 2000.
87. Florida Department of Health and Rehabilitation Services (FDHRS). Interdepartmental memorandum to Michael Flanery from Andrew Reich concerning private well sampling near Stauffer. Tallahassee, FL. May 29, 1990.
88. Chantz M. Drought shuts down Tarpon Spring's water wells. The Suncoast News. June 14, 2000.
89. City of Tarpon Springs. Letter to ATSDR ombudsman from Mark Schroeder concerning city wells. Tarpon Springs, FL. July 21, 2000.
90. EPA. Interim final site inspection report of Stauffer. Washington DC: EPA Waste Management Division; March 11, 1991.
91. Krueger C. High radon levels are found. State to check water at old plant in Tarpon Springs. St Petersburg Times. May 13, 1988;1:15.

92. FDER. Letter to Dennis Limbach from Joseph McGarrity concerning analysis of water samples near Stauffer. Tallahassee, FL. October 23, 1990.
93. KNL Laboratory Services. Public drinking water analysis report. Tampa: KNL; April 9, 1998.
94. ———. Public drinking water analysis report. Tampa: KNL; March 9, 1999.
97. City of Tarpon Springs. Letter to Wayne Wyatt from Mark Schroeder concerning wells in Tarpon Springs. Tarpon Springs, FL. September 29, 1999.
96. ———. Letter to Wayne Wyatt from Mark Schroeder concerning wells in Tarpon Springs. Tarpon Springs, FL. January 7, 2000.
98. ———. Letter to Wayne Wyatt from Mark Schroeder concerning wells in Tarpon Springs. Tarpon Springs, FL. March 10, 2000.
99. KNL Laboratory Services. Public drinking water analysis report. Tampa: KNL; May 3, 1999.
100. FDOH. Water analysis for Pasco County. Jacksonville: FDOH; July 28, 1998.
101. Ulferts A. Well's contamination levels remain high. Pasco Times. July 21, 1999.
102. City of Tarpon Springs. Letter to Wayne Wyatt from Mark Schroeder concerning wells in Tarpon Springs. Tarpon Springs, FL. April 6, 1999.
103. Harbor Branch Environmental Laboratory. Radiochemical analysis of a Pasco County well. Fort Pierce, FL: Harbor Branch Environmental Laboratory; March 24, 1999.
104. EPA. Current drinking water standards. Available at:  
<http://www.epa.gov/OGWDW/wot/appa.html>.
105. Environmental Health Services. Facsimile to ATSDR ombudsman from Albert Gagne concerning well test results for Stauffer. New Port Richey, FL. June 15, 2000.
106. Krueger C. Anclote River dredging plan raises pollution concerns. St Petersburg Times. November 19, 1987;3:1,6.
107. Gross E. Is river safe for fish, people? St Petersburg Times. August 23, 1998;1.
108. EPA. Superfund proposed plan fact sheet for Stauffer. Atlanta: EPA Region IV; May 1996.
109. Blanchard J. E-mail to Mary Mosley concerning contaminants of concern. Atlanta, GA. February 3, 2000.
110. ———. E-mail to Mary Mosley concerning contaminants of concern. Atlanta, GA. February 15, 2000.

111. US Department of the Interior. 1999. Sinkholes, West-central Florida. A link between surface water and ground water. Tallahassee: US Department of the Interior, US Geological Survey.
112. Pittman C. River's history runs deep, from pirates to pariahs. St Petersburg Times. March 17, 1991;1:1,3.
113. Executive Reporting Service. Environmental protection town meeting. Second EPA national ombudsman hearing. St Petersburg: Service; February 12, 2000.
114. Danielson R. Expert: sinkhole may plague Stauffer. St Petersburg Times. August 19, 2000.
115. EPA. Potential hazardous waste site preliminary assessment of Stauffer. Form 2070-12. March 3, 1987.
116. FDEP. Floridan aquifer review by Craig Feeny. March 3, 1987.
117. Names withheld. Letters to Bruce Tuovila concerning health problems from a former Stauffer worker. Various dates.
118. FDER. Interoffice memorandum to Craig Feeny from Eric Nuzie concerning on-site inspection of Stauffer. March 9, 1987.
119. Feeny C. Conversation record with Jess Barkley. February 19, 1987.
120. FDER. Letter to Richard Ferrazzuolo from Eric Nuzie concerning modifications to the preliminary assessment of Stauffer. Tallahassee, FL. March 19, 1987.
121. ———. Conversation record with George Nicholas. Pinellas County. January 27, 1987.
122. ATSDR Ombudsman. Record of interview with one former Stauffer employee. June 7, 2000.
123. Newspaper clipping concerning phosphate fires. March 12, 1987.
124. Board of County Commissioners of Pinellas County. Letter to Jerry Harris from Peter Hessling concerning the first warning notice. Clearwater, FL. March 25, 1987.
125. Emergency Planning and Community Right-to-Know-Act of 1986. Statement of determination form from Jerry Harris. Tarpon Springs, FL; February 14, 1995.
126. Memorandum of understanding between Tarpon Springs Fire Department and Zeneca. Tarpon Springs, FL. September 25, 1996.
127. Prior incidents at 877 Anclote Rd.

128. Zeneca. Letter to Maxwell Kimpson from FR McNeice concerning phosphorus oxidation emission evaluation. Wilmington, DE. October 30, 1996.
129. City of Tarpon Springs. Request for invoicing. Tarpon Springs, FL; January 3, 1997.
130. Pritchard B. Tour of Victor Chemical plant intrigues bankers. Tarpon Springs Leader. December 8, 1949.
131. Stauffer. Phosphorus production. Tarpon Springs: Stauffer, Industrial Chemical Division.
132. Brophy L, Miles W, Cochrane R. 1959. The chemical warfare service: from laboratory to field. Washington DC: Office of the Chief of Military History.
133. Army Service Forces. Facilities production report. September 1, 1945.
134. Rollins Environmental Services. Waste data sheet. August 9, 1984.
135. Tennessee Department of Conservation. Letter to Thomas Mirabito from Tom Tiesler concerning crude phosphorus. Nashville, TN. February 21, 1992.
136. Complaint/Felony. California v Stauffer; BA 023527. Municipal Court of Los Angeles, State of California. August 14, 1990.
137. Guilty Plea. California v Stauffer; BA 023527. Superior Court of the State of California for the County of Los Angeles. November 20, 1992.
138. Stauffer. Letter to Maxwell Kimpson from George Heuler concerning implementation plan modifications at Stauffer. Wilmington, DE. June 10, 1997.
139. ———. Letter to Ernest Roggelin from FR McNeice concerning financial responsibility. Tarpon Springs, FL. September 24, 1999.
140. EPA. Letter to Frank McNeice from Robert Heiss concerning Stauffer's intent to export hazardous waste to Canada. Washington, DC. October 6, 1999.
141. Stauffer. Community advisory concerning the removal of dilute phosphoric acid. Tarpon Springs, FL; November 5, 1999.
142. Lawson J. Uranium was extracted at Stauffer plant. January 27, 1987.
143. ATSDR Ombudsman. Record of interview with George McCall. August 2, 2000.
144. ———. Record of interview with Jack Lawson. August 28, 2000.
145. ———. Record of interview with Eric Nuzie. August 30, 2000.

146. ———. Record of interview with John Armstrong. August 30, 2000.
147. ———. Record of interview with Carl Frode. August 20, 2000.
148. ———. Record of interview with Dave Ingle. September 6, 2000.
149. ———. Record of interview with Blaine LeCouris. September 11, 2000.
150. ———. Record of interview with Jim Robins. September 6, 2000.
151. ———. Record of interview with Damion DeRoeber. September 6, 2000.
152. Department of Energy discloses long secret contractor list. USA Today. September 21, 2000.
153. Hammer J. Letter to Charles Rainey concerning military training exercises in Pinellas County. Edgewater, MD. July 5, 1996.
154. Mosley M. E-mail to ATSDR ombudsman concerning military exercises. Tarpon Springs, FL. September 15, 2000.
155. Pittman C. Groundwater at Equifax contaminated. St Petersburg Times. August 18, 2000;1.
156. ———. Hair-loss chemical thallium not found at Equifax. St Petersburg Times. August 31, 2000.
157. ———. Equifax pays for tests of workers. St Petersburg Times. September 2, 2000.
158. ATSDR. E-mail to Randy Merchant from ATSDR ombudsman concerning former Stauffer workers. Atlanta, GA. April 12, 2000.
159. Merchant R. E-mail to ATSDR ombudsman concerning former Stauffer workers. Tallahassee, FL. April 13, 2000.
160. ATSDR. Letter to Randall Merchant from ATSDR ombudsman concerning public health documents for Stauffer. Atlanta, GA. April 17, 2000.
161. Merchant R. E-mail to ATSDR ombudsman concerning former Stauffer workers. Tallahassee, FL. April 26, 2000.
162. FDOH. Interoffice memorandum to Amy Jones from Randy Merchant concerning confidentiality of former Stauffer workers. Tallahassee, FL. May 5, 2000.
163. ———. Interoffice memorandum to Randy Merchant from Amy Jones concerning confidentiality of former Stauffer workers. Tallahassee, FL. June 26, 2000.

164. ATSDR. Program announcement 607.
165. ———. E-mail to Peter McCumiskey from David Ayers concerning cooperative agreements. Atlanta, GA. October 20, 2000.
166. Comprehensive Environmental Response, Compensation, and Liability Act, 42 USC §9604(2).
167. ATSDR. E-mail to Peter McCumiskey from David Ayers concerning cooperative agreements. Atlanta, GA. October 20, 2000.
168. ——— Ombudsman. Record of interview with Bruce Tuovila. June 13, 2000.
169. FDOH. Letter to ATSDR ombudsman from Randall Merchant concerning public health assessments of Stauffer. Tallahassee, FL. March 22, 2000.
170. Angel. E-mail to Mary Mosley concerning Stauffer. July 8, 1999.
171. Mosley M. Letter to Marvin Doyal concerning complaints about FDOH. Tarpon Springs, FL. March 24, 1998.
172. FDOH. Letter to Brian Spiller from James Howell concerning former Stauffer workers. Tallahassee, FL. December 3, 1996.
173. Kelly M. Letter to Bruce Tuovila concerning list of former Stauffer workers. Wilmington, DE. March 5, 1997.
174. FDOH. Letter to former Stauffer employees from Bruce Tuovila. Tallahassee, FL. June 9, 1997.
175. ———. Letter to ATSDR ombudsman from Randall Merchant concerning three questions. Tallahassee, FL. June 6, 2000.
176. Deposition of Myers in the case of Anderson v Stauffer, 428-30-1697. State of Florida, Department of Labor and Employment Security. November 14, 1986.
177. FDOH. Memorandum to Randy Merchant from Bruce Tuovila concerning Mr. Tuovila's resignation. Tallahassee, FL. June 17, 1999.
178. Spartacus Educational. Biography of Catherine Booth. Available at: <http://www.spartacus.schoolnet.co.uk/Wbooth.htm>.
179. Burke J. Letter to ATSDR ombudsman concerning police reports. Tarpon Springs, FL. August 20, 1999.

180. Pinellas County Sheriff's Office. CID/Arson unit report No. 99-87985/1. Tarpon Springs, FL. May 6, 1999.
181. ———. Incident/Offense supplement report No. 99-87985/2. Tarpon Springs, FL. May 11, 1999.
182. Nastoff T. E-mail to ATSDR ombudsman concerning flip chart minutes. Atlanta, GA. April 28, 2000.
183. Florida State University. Letter to Lu Grimm from Christopher Teaf concerning employment. Tallahassee, FL. August 27, 1997
184. Weston. Analytical results. Additional soil sampling program. Gulfside elementary school. West Chester, PA; April 1996.
185. Mosley M. Letter to ATSDR ombudsman concerning a request for assistance. Tarpon Springs, FL. March 6, 2000.
186. Substances of concern for exposure monitoring listed by approximate priority for Stauffer.
187. ATSDR Ombudsman. Record of interview with one former Stauffer employee. June 13, 2000.
188. Deposition of Dunn in the case of Anderson v Stauffer, 428-30-1697. State of Florida, Department of Labor and Employment Security; Division of Worker's Compensation; Tallahassee, FL (1987). August 15, 1985.
189. ATSDR Ombudsman. Record of interview with Dan Flaherty. April 18, 2000.
190. Deposition of Dale in the case of Anderson v Stauffer, 428-30-1697. State of Florida, Department of Labor and Employment Security; Division of Worker's Compensation; Tallahassee, FL (1987). March 12, 1985.
191. Hudson v Stauffer; 98-MAY. Class representation in the Circuit Court in and for Pinellas County, Florida, Civil Division.
192. ATSDR Ombudsman. Record of interview with Peter Hessling.
193. Gross E. Study of plant's effect on students pondered. St Petersburg Times. January 6, 1998.
194. ———. Expert planning to study students, Stauffer. St Petersburg Times on line. July 28, 1998.
195. Executive Reporting Service. Environmental protection town meeting. Second EPA national ombudsman hearing. St Petersburg: Executive Reporting Service; February 12, 2000.



196. Stauffer. Inter-office correspondence to JF Harris from RE Dale concerning exposure records/data analysis. Tarpon Springs, FL. October 5, 1982.
197. FDHRS. Letter to David Sundin from Bruce Tuovila concerning the distribution of the fact sheet. Tallahassee, FL. July 25, 1996.
198. Stauffer. Notice to employees. Health hazard communications. Tarpon Springs, FL; March 6, 1981.
199. ATSDR Ombudsman. Record of interview with Jessie Burke.
200. Psaras G. Letter to David Sundin concerning a request for a health assessment. Tarpon Springs, FL. April 8, 1998.
201. Kelly M. Letter to Bruce Tuovila concerning the list of former Stauffer employees. Wilmington, DE. February 24, 1997.
202. ———. Letter to Bruce Tuovila concerning the modifications to the worker safety announcement. Wilmington, DE. February 10, 1997.
203. Name withheld. Letter to Bruce Tuovila concerning working conditions at Stauffer.
204. Coalition against the United States Exporting Dolphins. Letter to James Howell from Mary Mosley concerning the letter to healthcare professionals. Tarpon Springs, FL. April 23, 1997.
205. Stauffer. Letter to Bruce Tuovila from Michael Kelly concerning the list of former Stauffer employees. Wilmington, DE. February 7, 1997.
206. ATSDR Ombudsman. Record of interview with one former Stauffer employee. June 13, 2000.
207. ———. Record of interview with one former Stauffer employee. June 7, 2000.
208. ———. Record of interview with five former Stauffer employees. June 6, 2000.
209. ———. Record of interview with Leonard Dunn. April 18, 2000.
210. Mease Hospital and Clinic. Letter to Drew Tanney from Leonard Dunn concerning Eugene Anderson's medical history. Dunedin, FL. December 12, 1983.
211. University of South Florida. Letter to Charles Bentley from Keith Chandler concerning Eugene Anderson's medical history. Tampa, FL. February 25, 1986.
212. Deposition of Chandler in the case of Anderson v Stauffer, 428-30-1697. State of Florida, Department of Labor and Employment Security; Division of Worker's Compensation; Tallahassee, FL (1987). July 7, 1986.

213. Exposure monitoring results report. Deposition of Dale in the case of Anderson v Stauffer, 428-30-1697. State of Florida, Department of Labor and Employment Security; Division of Worker's Compensation; Tallahassee, FL (1987). March 12, 1985.
214. Stauffer. Foreword and table of contents (only) to the Stauffer safety manual. .
215. US Department of Labor, OSHA. Letter to ATSDR Ombudsman from Richard Fairfax concerning the health impact of Stauffer. Washington, DC. April 20, 2000.
216. EPA. Petition for reconsideration of February 6, 1985, final rule concerning standards for radionuclide emissions from elemental phosphorus plants.
217. ———. What is radiation? Available at:  
<http://www.epa.gov/r10earth/offices/oec/idslag/doc/handouts.htm>.
218. ———. What is phosphorus slag? Available at:  
<http://www.epa.gov/r10earth/offices/oec/idslag/doc/handouts.htm>.
219. ATSDR Ombudsman. Record of interview with Michael Brooks. August 2, 2000.
220. Dickey B. Letter to Kaufman and Martin concerning off-site slag. May 31, 2000.
221. ATSDR. Preliminary public health assessment for Monsanto, Soda Springs plant, Soda Springs, ID. Atlanta: US Department of Health and Human Services; March 25, 1992.
222. ———. Exposure investigation of the Soda Springs industrial sites, Soda Springs, ID. Atlanta: US Department of Health and Human Services; December 16, 1998.
223. EPA. September 1995 fact sheet on Southeast Idaho phosphorus slag. Available at:  
<http://www.epa.gov/r10earth/offices/oec/idslag/doc/factsept.htm>.
224. Flanery M. Letter to Bruce Tuovila concerning comments to the draft consultation. February 26, 1998.
225. Gross E. Study: Slag's dangers unclear. St Petersburg Times. March 24, 1998.
226. ATSDR. Memorandum to Joel Mulder from Paul Charp concerning the Soda Springs health consultation. Atlanta, GA. May 18, 1990.
227. Hoag C. Letter to ATSDR ombudsman concerning the risk assessment of Stauffer. New Port Richey, FL. September 20, 2000.
228. Stauffer. Letter to Sam Sahebzamanai from Bruce McClellan concerning FDEP's review of the waste sludge lagoon system. Tarpon Springs, FL. August 5, 1985.
229. Gross E. Stauffer testing turns up little asbestos in soil. St Petersburg on-line. July 21, 1998.

