



Oregon Department of Human Services  
Superfund Health Investigation and Education Program (SHINE)

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## HEALTH CONSULTATION

Cancer Investigation for Three Neighborhoods  
Surrounding J.H. Baxter & Co.  
Eugene, OR

Public Comment Release  
September 7, 2006 to September 30, 2006

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Prepared by the  
Oregon Public Health Division  
Superfund Health Investigation and Education Program

Under Cooperative Agreement with the  
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## **Public Comment Release**

This document is being released for public comment. The public comment period is an opportunity for the public to comment on SHINE's findings or proposed activities contained in this draft document. The public comment period for this document is from September 1, 2006, through October 15, 2006. Comments are requested and should be directed to

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Or you can call 503-731-4025 to obtain an email address for submitting comments electronically.

## Summary

The Superfund Health Investigation and Education (SHINE) program, part of Oregon Public Health Division (OPHD), developed this health consultation in response to a cancer investigation request in the neighborhoods of Bethel, River Road, and Trainsong located in Northwest Eugene, Oregon. These densely populated neighborhoods border the J.H. Baxter wood treatment plant, along with several other industrial sites. While collecting community concerns for the J.H. Baxter site in 2003, SHINE was petitioned by community members living in this area to investigate the incidence of acute myelogenous leukemia (AML) and brain cancer. Residents were concerned that there were excess rates of these two types of cancers, possibly caused by contaminants released from the wood treatment facility along with the other nearby industries. SHINE reviewed cancer rates in this area to determine if the number of cases of AML, brain, nasal, and lung cancers was higher than expected from 1996 to 2003, the years for which data are available from the state cancer registry. The cancer investigation focused on the rates of these cancers in the six census tracts that make up the Bethel, River Road, and Trainsong neighborhoods. Rates of AML and brain cancer were reviewed because these were the cancers residents thought might be occurring at higher rates. Rates of lung and nasal cancer were added to the review because of the close proximity of the wood treatment plant and the association between exposure to the wood preservative creosote with these cancers. There were no statistically significant elevations for any of the cancers in the area investigated.

## Purpose and Health Issues

The Superfund Health Investigation and Education (SHINE) program, part of Oregon Public Health Division, prepared this health consultation to address whether certain types of cancer are elevated in the neighborhoods of Bethel, River Road, and Trainsong located in northwest Eugene, Oregon. While collecting community concerns for the J.H. Baxter site in 2003, SHINE was petitioned by community members living in this area to investigate the incidence of acute myelogenous leukemia (AML) and brain cancer.

In 2003, SHINE completed a health consultation for J.H. Baxter, which concluded that there was not enough data to evaluate whether contaminants being released from J.H. Baxter posed a public health risk. The document stated that although the low-level concentrations of contaminants from J.H. Baxter were not likely to be associated with elevated cancer rates, the investigation should be conducted to address the resident's concerns [1]. SHINE recommended that the Oregon State Cancer Registry (OSCaR) and SHINE collaborate to complete this investigation. Excess brain cancer rates were brought up as a concern during a public meeting for J.H. Baxter so it was added to the investigation.

In 2004, OSCaR performed an initial investigation into the rates of AML and brain cancer in northwest Eugene near J.H. Baxter. That investigation used data reported at the zip code level, and produced no evidence of increased rates for the cancers of concern.

At that time, OSCaR was in the process of adding data to their database that allowed them to analyze the data for individual census tracts, which are smaller geographic areas than zip codes. OSCaR and SHINE concluded that when the complete data set became available, another review of the data would be performed. This health consultation summarizes the results of the census tract-level cancer investigation performed by OSCaR.

The follow-up census tract-level cancer investigation began in the winter of 2005. The focus was on census tracts 26.00, 27.00, 28.00, 41.00, 42.00, and 43.00 because they make up the majority of the area in the Bethel, River Road, and Trainsong neighborhoods. In addition to AML and brain cancer, SHINE requested that OSCaR expand the investigation to include lung and nasal cancer because these cancers have been linked to exposure to creosote which is used for wood treatment by J.H. Baxter.

This health consultation focuses on answering the specific question about cancer rates in these neighborhoods. SHINE is aware that, in addition to cancer rates, residents in the three neighborhoods have expressed concerns about other potential health effects from exposure to contaminants released by J.H. Baxter and the other industrial sites in the immediate area. Although there are many sources of contamination near the three neighborhoods, we are unable to draw conclusions about the public health impacts related to the individual or collective contaminant sources at this time. SHINE does plan to re-evaluate the public health impact posed by emissions from J.H. Baxter as air monitoring results become available.

## Background

In 2003, residents of the Bethel, River Road, and Trainsong neighborhoods expressed concern to SHINE staff about increased rates of AML and brain cancer due to chemicals released by industrial sites closely bordering the densely populated neighborhoods. A map of the area of interest can be seen in Figure 1. According to the U.S. 2000 Census (Table 1), approximately 36,000 people live in Bethel, River Road, and Trainsong neighborhoods. The primary census tracts that make up the three neighborhoods are 26.00, 27.00, 28.00, 41.00, 42.00, and 43.00 (Figure 1).

The concerns about cancer rates were raised while SHINE was evaluating the health risk posed by emissions from J.H. Baxter and Company, a wood treatment plant. The original complaint from community members was the unpleasant odor coming from wood creosoting plant. During a public meeting they described their frustration with the odors coming from the plant, and their concerns that exposure to the chemicals coming from this plant could be causing health effects, specifically cancer, in local residents. The chemical compounds used as preservatives at J.H. Baxter include pentachlorophenol, creosote, and ammonia copper zinc arsenate (ACZA). SHINE prepared an initial health consultation to evaluate public health risks related to emissions from the J.H. Baxter plant. Inhalation was identified as a completed exposure pathway for the site. The initial consultation concluded that there was an *indeterminate public health hazard* because of a lack of data. The health consultation recommended that more data on emissions from the

site be gathered to better assess chemicals released by the plant. The health consultation also concluded that an investigation be conducted to address the cancer concerns raised by community members although it was unlikely that the wood preservative emissions from the plant could be associated with increased cancer rates. It was suggested that the cancer investigation be conducted in coordination between the community, SHINE, and the Oregon State Cancer Registry (OSCaR). The Lane Regional Air Pollution Agency (LRAPA) is currently conducting air sampling, and a follow-up health consultation will be prepared after this sample collection is complete to re-assess public health risk from exposure to contaminants from J.H. Baxter.

Several other industrial sites also exist near residents' homes in or near the Bethel, River Road, and Trainsong neighborhoods (Figure 1), including Union Pacific Railroad (UPRR), many of which contain chemicals released in the area that are known or suspected carcinogens. Although there are many sources of contamination in these neighborhoods, we are unable to draw conclusions about the public health impacts from the individual or collective contaminant sources at this time.

### **Community Health Concerns**

SHINE has had many opportunities to collect and listen to concerns expressed by residents in Trainsong, Bethel, and River Road neighborhoods over the past several years. Concerns have ranged from the immediate effects of breathing in air emissions from J.H. Baxter to long-range health effects, particularly cancer. Other long-term concerns include endocrine disruption, and damage to the respiratory and immune system. Residents have expressed concern regarding the contamination of air, soil, and water. Several residents have questions about how contaminants released from heavy automobile traffic and the numerous industrial sites may interact and impact the health of neighborhood residents.

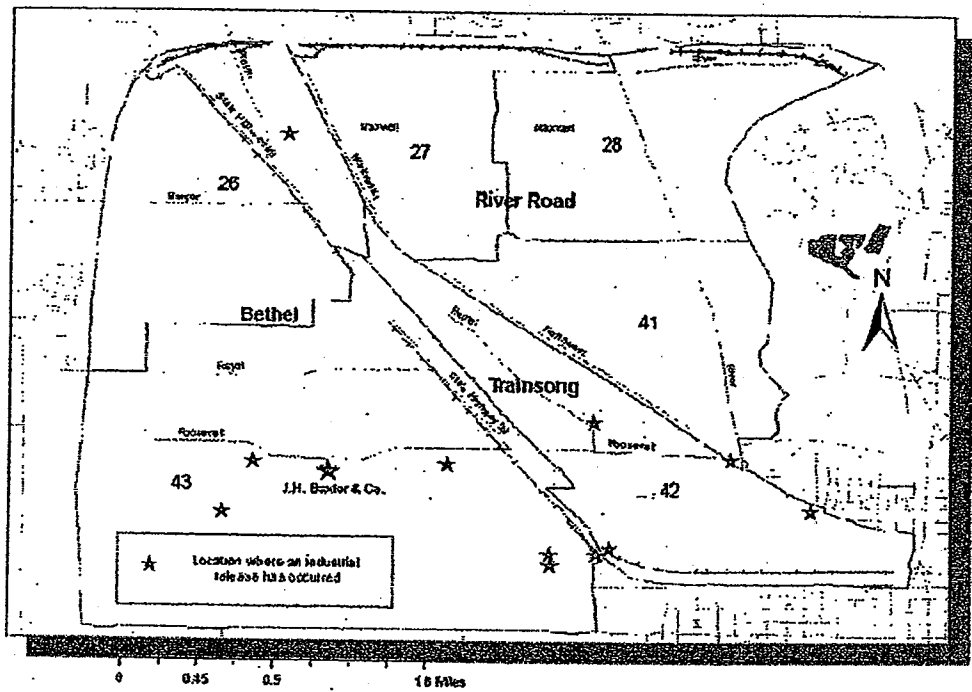
Residents' specific concerns related to a potential cancer cluster stemmed from a number of AML cases within a small area in the Bethel neighborhood. Residents also learned about what seemed to them an unusual number of brain cancer cases in the neighborhood. Because of the odors from J.H. Baxter and knowledge about chemicals released by the different industrial sites, residents came to believe that these cancer cases were related to environmental exposures. This document is intended to address some of those concerns.

### **Eugene Neighborhood Cancer Investigation History**

In 2004, information on cancer rates was only available at the zip code level (for zip code 97402) at the time the initial Eugene cancer investigation was requested for AML and brain cancer [2]. Because of the data limitations, a more detailed look at cancer incidence at the neighborhood level was not possible in 2004. Residents felt there were an unusual number of AML cancer cases within the Bethel neighborhood, a much smaller area than what was reviewed at the zip code level. A community member consulted with

a local physician and he stated that he thought the number of AML cases in the small geographic area seemed elevated. The neighborhood associations also felt that they knew of an unusually large number of brain cancer cases in northwest Eugene but did not specify in which neighborhood. In 2004, an OSCaR staff member recommended that a more detailed cancer investigation be conducted at the census tract level once geocoded information was available to better address area residents' specific concerns.

**Figure 1. Map of Census Tracts and Industrial Sites in Bethel, River Road, and Trainsong Neighborhoods, Eugene, OR.**



### Methods

After the data for census tracts became available for the years 1996 to 2003, the Oregon State Cancer Registry (OSCaR) reviewed cancer cases for the census tracts that make up the majority of the area in the Bethel River Road, and Trainsong neighborhoods. Information available from OSCaR about cancer in Oregon comes from a variety of sources including hospital cancer registries/medical records departments, ambulatory surgical centers, physician offices, pathology laboratories, other state cancer registries, and death certificates. Citizens can also report cases to OSCaR directly by means of the "Cancer Inquiry Report Form".

The number of cancer cases (the "observed" cases) in each identified census tract was compared with the number of "expected" cases for each census tract during the years

between 1996 and 2003 (See summary below). OSCaR used current cancer rates in the State of Oregon to calculate the number of cases of AML, brain, lung, and nasal cancers expected in these census tracts (background information on these four cancers can be found in Appendix A). They also did a comparison for all other cancers combined to determine whether cancer in general is elevated in those census tracts.

**Table 1. Demographic Information for Bethel, River Road, and Trainsong Neighborhoods\***

|  | Bethel | River Road | Trainsong |
|--|--------|------------|-----------|
| <b>Total Population</b>                        | 22,689 | 11,731     | 1,775     |
| <b>Percent of Total Eugene Population</b>      | 14.10% | 7.30%      | 1.50%     |
| <b>Male</b>                                    | 11,004 | 5,741      | 943       |
| <b>Female</b>                                  | 11,685 | 5,990      | 832       |
| <b>Race or Ethnicity</b>                       |        |            |           |
| White  | 20,536 | 10,440     | 1,452     |
| Black  | 216    | 123        | 13        |
| American Indian Alaskan Native                 | 246    | 180        | 22        |
| Asian  | 298    | 98         | 13        |
| Native Hawaiian, Pacific Islander              | 42     | 24         | 6         |
| Hispanic or Latino                             | 1,236  | 721        | 306       |
| Other race                                     | 508    | 368        | 169       |
| Two of more races                              | 843    | 498        | 100       |
| <b>Number of Households</b>                    | 9,295  | 4,686      | 713       |
| Renter Occupied                                | 2,636  | 1,498      | 436       |
| Owner Occupied                                 | 6,173  | 3,042      | 212       |
| <b>% Population below poverty level - 1999</b> | 11.70% | 12.60%     | 38.40%    |

\*Data is specifically for the 6 census tracts that make up the majority of Bethel, River Road and Trainsong Neighborhoods.

The method for calculating the expected number of cases in a small geographic area often produces some odd effects; specifically it is not uncommon that the number of expected cases at the census tract level could be expressed as a fraction of a person, (i.e. 2.4 expected cases). This is because the number of expected cases is based on the number of cases in the larger population, and cancer at the population level is expressed in terms of the number of cases per 100,000 people. For example, if the rate for the number of bladder cancer cases in Oregon in 1996 was 24/100,000 and we were looking at a geographic area that only included 1,000 people we would say the number of expected cases of bladder cancer is .24 - or roughly 1/4 of a case. This happens because there is a relatively low rate of bladder cancer at the population level (i.e. 0.24) and because the local population is small (1,000). This is important to understand because of the way that we express the excess number of observed cases. For instance, if we expect .24 cases, and

we observe 1 case, mathematically we would say we have four times the number of cancer cases than expected. This is misleading because it suggests that we have a much larger problem than we actually do, when what we actually have is a mathematical effect from a small number of cases.

One way to address this problem caused by small numbers is to test the numbers statistically. A statistical test, called a chi-square test, is run on the observed vs. expected numbers to determine if there is a "statistically significant" difference between the numbers we expect to see and number we actually see. This test helps us evaluate whether the difference between the expected and observed numbers is significant and not a result of chance or coincidence. It does not, however, tell us why there is a significant difference.

### Results

After running statistical tests, we learned that there were no statistically significant elevations for any of the cancers investigated, in any of the census tracts during the period 1996-2003 in the three Eugene neighborhoods.

Table 2 is a summary of cancer cases for all six-census tracts from 1996 to 2003 and compares the actual number of cases (the "observed") to the number of cases we would expect to see, based on the rates of these cancers in Oregon. In one instance the number of cases of brain cancer was significantly greater than the number of cases we expected to find; in census tract 26 there were 6 cases of brain cancer when we expected to see 2.8. We examined the data for brain cancer more closely and could see the number of cases of brain cancer was higher than expected in the years 2001 and 2002, but there was no significant elevation in the observed number of cases in that census tract before 2001 or after 2002 (Table 3).

**Table 2. Summary of Cancer Cases in Six Census Tracts in Northwest Eugene, OR between 1996-2003 ( See Appendix A for Detailed Data Tables).**

| Census Tract | 1996-2003 |             |            |              |           |             |          |            |                |              |
|--------------|-----------|-------------|------------|--------------|-----------|-------------|----------|------------|----------------|--------------|
|              | AML       |             | Lung**     |              | Brain     |             | Nasal    |            | All Cancers ** |              |
|              | Obs       | Exp         | Obs        | Exp          | Obs       | Exp         | Obs      | Exp        | Obs            | Exp          |
| 26           | 1         | 2.2         | 33         | 24.2         | 6         | 2.8         | 1        | 0.3        | 155            | 150.0        |
| 27           | 0         | 1.6         | 24         | 19.0         | 0         | 2.1         | 0        | 0.2        | 109            | 114.6        |
| 28           | 2         | 1.5         | 11         | 18.2         | 4         | 2.1         | 0        | 0.2        | 102            | 114.5        |
| 41           | 1         | 1.4         | 19         | 15.3         | 3         | 2.0         | 0        | 0.2        | 90             | 101.6        |
| 42           | 0         | 1.1         | 21         | 8.5          | 2         | 1.6         | 1        | 0.1        | 55             | 67.0         |
| 43           | 6         | 3.0         | 31         | 37.1         | 4         | 3.7         | 0        | 0.4        | 184            | 220.2        |
| <b>Total</b> | <b>10</b> | <b>10.8</b> | <b>139</b> | <b>122.3</b> | <b>19</b> | <b>14.3</b> | <b>2</b> | <b>1.4</b> | <b>695</b>     | <b>767.9</b> |

\*Chi Square = 3.657,  $p < .05$

\*\*Data not available for 2003

While we are always concerned with possible evidence of higher than expected rates of cancer, it is difficult to draw conclusions from these findings because small increases in cancer rates in small geographic areas are not uncommon. In other words, this measurable increase in brain cancer may be due to chance; a possibility strengthened by the fact that we only see an increase over a two-year period, with very low numbers of cases in the years before the 2001 and no cases after 2002.

### **Sensitive Populations**

Several factors put people at greater risk for developing cancer. Some people are more susceptible to developing cancer because they inherit altered genes, a weak immune system, or altered hormone levels [3]. Exposure to a cancer-causing chemical, behavioral choices, health, age, and gender can put people at greater risk for developing different types of cancer in addition to inherited conditions or genes. Occupational exposure to certain substances may also put workers at greater risk for developing cancer.

### **Child Health Considerations**

In general, SHINE and ATSDR recognize that infants and children may be more vulnerable than adults to exposures to contaminants in air, water, soil, or food. However, children in this area were no more likely to have increased rates of cancer than their adult counterparts.

### **Conclusions**

There were no statistically significant elevations for any of the cancers in the area investigated. Observed cases of brain cancer were higher than expected in tract 26.00 during 2000 and 2001. However, over the period from 1996 to 2003, this elevation was not statistically significant, and no cases of brain cancer have occurred since 2001. AML, lung, nasal, and all other cancers combined are not statistically significantly elevated in the six census tracts that make up the majority of Bethel, River Road, and Trainsong neighborhoods in Northwest Eugene, Oregon. Observed elevation of malignant brain cancer cases in census tract 26.00 (northwest Bethel neighborhood) is also not statistically significant and appears to not be ongoing. This elevation occurred only for the years 2001 and 2002 and did not occur in the five years prior or two years after. Environmental contamination from J.H. Baxter or other industrial sites do not appear to be causing elevated rates of cancer in the Bethel, Trainsong, and River Road neighborhoods. This investigation was limited by a number of factors; specifically the limited availability of data for cancer incidence, the fact that there was no exposure information on any of the 6 identified cases, and finally that relied on population estimates to calculate expected rates of cancer in the census tracts. Despite these limitations we have concluded that there is no statistically significant increase in the number of cancers when compared with the expected number of cases in this area.

