



**Health Impact of the EH Glass Waste Disposal Site:
Report to the Greensboro City Council
November 12, 2009**

Background

On June 19, 2009 the Department of Public Health received a request from the Office of the City Manager of the City of Greensboro to assess the health impact on the neighboring community, if any, of the E.H. Glass waste disposal site located at 1103 Nealtown Road in eastern Greensboro. The property is listed on the NC Department of Environment and Natural Resources Inactive Hazardous Waste List as an Inactive Hazardous Waste Site. The request by the City of Greensboro City Council calls for “assessing the health effects reported related to disposal activities within and around the neighboring community”, and specifically requests the Department to “complete a health assessment survey in this area.”

Methods

The request for an assessment of the health effects of the E.H. Glass property on the neighboring community did not indicate concerns regarding particular health conditions nor were particular toxins or contaminants identified that might be associated with the site. Therefore the approach adopted by the Department was to cast a wide net with respect to examination of potential exposures as well as possible negative health impacts.

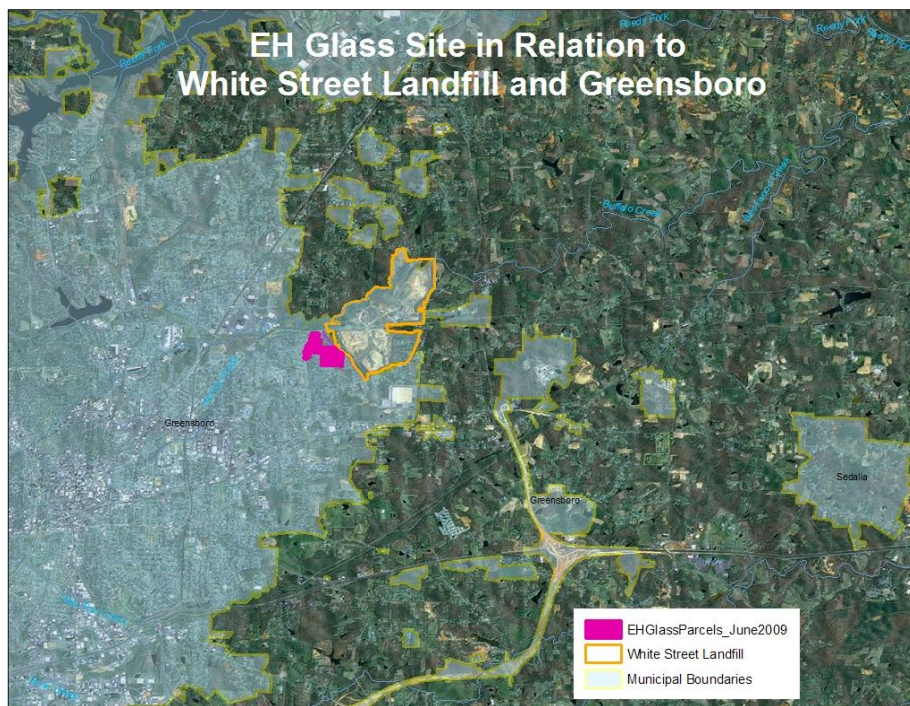


Figure 1: The E.H. Glass property lies in Eastern Greensboro adjacent to the White Street Landfill

The property in question at one time was owned by the E.H. Glass Company. Prior to World War II the property was in an unincorporated area of Guilford County and was utilized by area residents as an informal waste disposal site. During WWII the US Army—which maintained a personnel processing center nearby—discarded trash in the area. The property and surrounding area was incorporated into Greensboro in the mid-1950s. Waste disposal was discontinued at the site in the 1970s. As a known unlicensed disposal facility, the site was listed with the EPA during the discovery phase of the Superfund Program and was listed by the NC Department of Environmental and Natural Resources as an Inactive Hazardous Site. As a pre-regulatory waste disposal site, no records exist that describe what was dumped at the site or whether anything hazardous or toxic was dumped there. Anecdotally, in addition to the tires, car parts and other household trash that was disposed of in the area, it has been reported that up to 8,000 gallons of Vicks cough and nasal decongestant products were dumped on the property.

On July 16, 2009, an onsite inspection of the property was conducted by Schnabel Engineering on behalf of the NC Department of Environmental and Natural Resources. The inspection team observed two areas on the property showing evidence of past dumping. The disposal area was overgrown with trees, briars and tall grass. Exposed debris “included glass, metal debris, tires, auto parts, and furniture.” The inspectors observed “no notable erosion...offensive odors, stained or discolored soils, or slope failures.” Additionally, “there were no visible or evident potential gas migration pathways such as storm water drain systems, underground utilities, septic systems, or drain fields on the Disposal Area.” Their inspection was summed up as, “no immediate hazard was observed associated with the landfill area.” (Site Summary Report: EH Glass County Landfill. Prepared for the NC Department of Environmental and Natural Resources Superfund Section. Prepared by Schnabel Engineering South, 11-A Oak Branch Drive, Greensboro, NC, 27407).

Modes of Transmission

In order to experience a negative health impact from an environmental contaminant or toxin, community residents must be exposed to the chemical or toxin. The most common means of exposure are through groundwater or through air transmission. Figure 2 shows the elevation contours and water drainage for the EH Glass property area. Except for a few homes along Nealtown Road, the neighborhoods closest to the EH Glass property are to the Southeast of the property. The hydrology of the site is such that surface water and underground water drains away from the property to the North, into Buffalo Creek and then toward the NorthEast. When the area was incorporated into Greensboro and area housing development began in the 1950’s new homes were connected to municipal water supplies and nearly all existing homes switched from well to municipal water. Municipal water is drawn from lakes Townsend and Brandt which are located far from the area of concern.

Southwest to Northeast is also the general direction of wind flow in Guilford County, according to data from the Division of Air Quality in North Carolina’s Department of Environmental and Natural Resources (DENR) based on data from Piedmont Triad Airport wind monitoring station. Any potential air-borne contaminant emanating from the site would tend to blow *away* from nearby neighborhoods, limiting exposures.

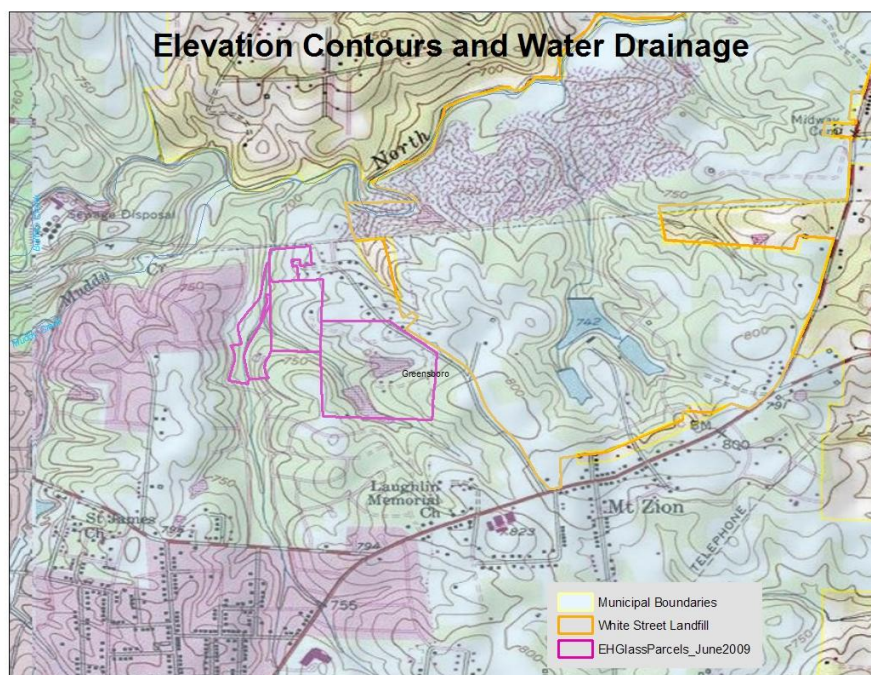


Figure 2: Topographic Elevation Contours and Water Drainage

Analysis of Birth and Mortality Data

No known environmental contaminants or toxins have been identified as present on the EH Glass property and potential contaminants would move away from residential neighborhoods due to the area hydrology and wind patterns. Nevertheless, Departmental staff conducted analysis of morbidity and mortality based on the unknown potential for transmission of environmental contaminants. Specifically, we examined birth outcomes and cancer mortality.

Previous research has shown that a relationship may exist between birth outcomes such as low birth weight and preterm birth and living near landfill and hazardous waste sites.¹⁻³ Additionally, some cancers are known to be associated with environmental exposures. Department staff conducted a comparative analysis of rates of cancer mortality, preterm birth and low birth weight among persons living within a four hundred yard area around the EH Glass site compared to persons living 400 to 800 yards from the site, and the general population of Guilford County. Mortality and birth certificate data for the five years from 2002-2006 were geocoded to residential street addresses in the area. A total of 1,812 persons lived in buffer zone 1 and 2,670 persons lived in buffer zone 2 in 2005 according to the US Census.

All-cause cancer rates for the two buffer zones around the EH Glass facility were not higher than for the county as a whole. Rates of low birth weight and preterm births similarly were not significantly higher than the rates for the county as a whole, and those living closest to the landfill area actually had the lowest rates, which would be unlikely to occur if community residents were exposed to environmental contaminants emanating from the EH Glass property. The higher rates of low birth weight and preterm births occurring in the second 400 yard buffer are well within the normal variability exhibited among county neighborhoods.

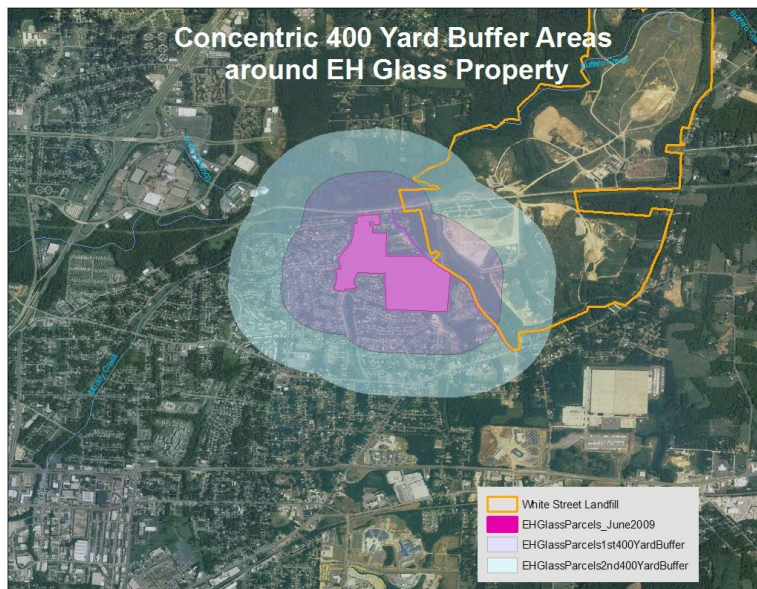


Figure 3: Two 400 Yard Buffer Areas around EH Glass Property

Table 1: Cancer and Birth Outcome Rates for Guilford County and 400 Yard Buffer Zones		
Health indicator	Guilford County, NC	
5 Year Average Rate of Cancer (2002-2006)	176.0 per 100,000 Population	
5 Year Average Percentage of Low Birthweight Births (2002-2006)	9.2%	
5 Year Average Percentage of Preterm Births (2002-2006)	12.5%	
	1 st 400 Yard Buffer Zone	2 nd 400 Yard Buffer Zone
Number of Cancers	16	21
Number of Low Birthweight Births	8	18
Number of Preterm Births	11	19
Number of Live Births	85	109
Total Population via Census Blocks	1,812	2,670
Rate of Cancer	176.6 per 100,000	157.3 per 100,000
Percentage of Low Birthweight Births	9.4%	16.5%
Percentage of Preterm Births	12.9%	17.4%

NC Central Cancer Registry (CCR) and the Occupational and Environmental Epidemiology Branch (OEE)

The Department of Public Health analysis used all-cause cancer mortality. In order to gauge the potential impact of proximity to the EH Glass site on specific prevalent cancers, the Department requested assistance from the Central Cancer Registry (CCR) and the Occupational and Environmental Epidemiology Branch (OEE). On November 3, 2009, the CCR released their report, *Cancer Incidence Analysis for Guilford County* (see attached).

Based on the recommendation of the OEE, the CCR analysis examined liver cancer, pancreatic cancer, multiple myeloma, leukemia, brain and central nervous system (CNS) cancer, Hodgkin disease, and non-Hodgkin lymphoma, as these conditions are commonly studied when environmental factors are implicated. They took

into consideration groundwater and air directional flows when designing their study area. Cases of these conditions going back to 1990 were geocoded and the study area was expanded designed to be large enough to capture sufficient numbers of cases to allow statistical analysis.

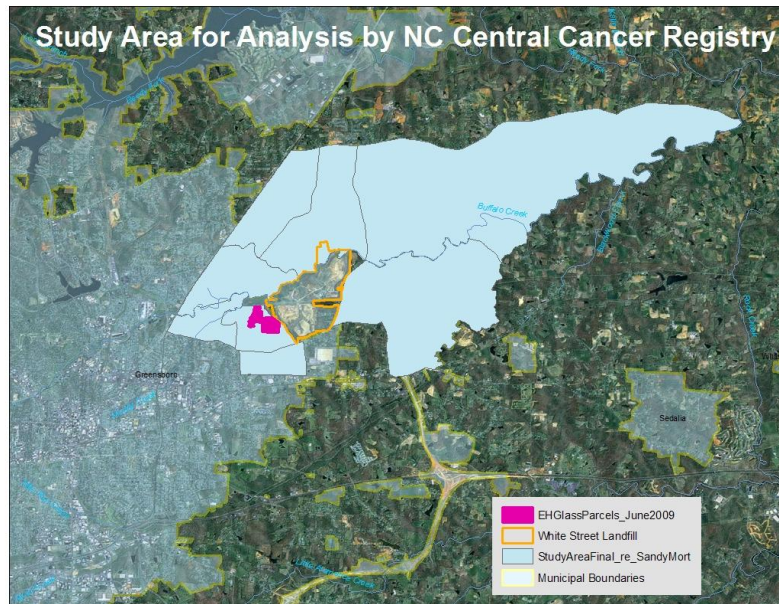


Figure 4: Central Cancer Registry Study Area

The CCR approach involved comparing the incidence of cancer cases in the study area to the expected level of cancer incidence based on the state age and gender specific cancer rates. Using this method, the CCR identified higher-than-expected incidence of multiple myeloma (13 cases, with 5.6 cases expected and an observed to expected ratio of 2.3) and pancreatic cancer (27 cases, with 13.3 expected and an observed to expected ratio of 2.03). The CCR report indicated that while the number of multiple myeloma cases was higher than expected, the number of cases was too small to draw reliable conclusions. With respect to the elevated level of pancreatic cancers, the report emphasizes that statistical association does not imply causation. They point out that there could be unidentified factors confounding the relationship and that there are other potential causes of cancer that are not related to the physical environment, including genetic and lifestyle factors such as smoking. Therefore, they conclude that “a causal link between the observed elevated rates and exposure to the landfill cannot be established based on the findings of this investigation.”

Discussion and Conclusions

The most salient issues relating to the question of the health impacts to the community of the EH Glass properties are as follows:

- No toxin or other environmental contaminant has been identified on the EH Glass property.
- Review of the historic uses of the landfill has not identified a potential threat to health.
- Drinking water is delivered through municipal sources so residents are not exposed to groundwater.
- Ground water and subsurface water flow away from the community.
- Air/wind blows away from the community toward the landfill.

- Evaluation of cancers using the cancer registry included all cancers in the database. Only one was found to be above the referent group. That finding could be a fluke of the process of looking at numerous variables to find an anomaly. If one makes a number of statistical comparisons, it is not unusual to find a statistically significant association by chance alone.
- The referent group was the state population as a whole. However, the population in the CCR study area is dissimilar to the demographic composition of the state as a whole, most notably with respect to percentage of African-Americans. Blacks make up about 21% of the NC population but 53% of the population of the study area. Rates of pancreatic cancer are known to be significantly higher among African-Americans, so this fact alone is likely to explain the “elevated” incidence of pancreatic cancer in the study area⁴.
- Environmental factors suspected of a causal relationship to pancreatic cancer include, along with smoking, such occupational exposures such as certain pesticides and some dyes^{5,6}. No evidence of the presence of these chemicals at the EH Glass landfill area has been discovered.

Based on these considerations, we conclude that there is no health risk to residents living near the EH Glass property and that further investigation, including community surveys, is unwarranted. Department of Public Health agency protocols call for in-depth epidemiological investigation such as surveys only after it has been determined that a health problem exists, a criteria that has not been met.

References:

¹Birth weight reduction associated with residence near a hazardous waste landfill. Berry, M, and Bove, F. Environmental Health Perspective. (1997) August; 105 (8): 856-861.

²Health effects of residence near hazardous waste landfill sites: a review of epidemiologic literature. Vrijheid, M. Environmental Health Perspective, (2000) March; 108 (Suppl 1): 101-112.

³Low Birth Weight and Preterm Births among Infants Born to Women Living Near a Municipal Solid Waste Landfill Site in Montreal, Quebec. Goldberg M. S., Goulet L., Riberdy H. and Bonvalot Y. Environmental Research, (April 1995)Volume 69, Issue 1: Pages 37-50.

⁴Epidemiology of pancreatic cancer. Michaud, D.S., Minerva Chir. (2004) Apr; 59(2): 99-111.

⁵Risk of pancreatic cancer and occupational exposures in Spain. Annals of Occupational Hygiene, Alguacil, J. et al. (2000) Vol 44, No 5, pp. 391-403.

⁶Pancreatic cancer mortality and organochlorine pesticide exposure in California, 1989-1996
Tim Clary, Beate Ritz, American Journal of Industrial Medicine, (2003) Volume 43 Issue 3, Pages 306 – 313.