



September 20, 2010

City of Oakwood
Attn: City Manager Norbert Klopsch
30 Park Avenue
Oakwood, Ohio 45419

Re: Health and Environmental Issues at Old River Athletic Fields.

Dear Mr. Klopsch:

This letter is responding to your request for an overall assessment of the issues regarding potential threats to human health and the environment related to the City of Oakwood property known as Old River Athletic Fields. I will first provide a short review of past work related to environmental issues at Old River Fields and then provide a summary of current status. In addition to the environmental work reported on in this letter, LJB has also provided engineering services such as planning for road access to the parking lot, parking lot layout, corporation line changes, and other non-environmental issues.

Previous Environmental Work Related to Old River Athletic Fields

LJB has addressed on Oakwood's behalf a number of environmental issues at Old River Fields over the past seven years. Below is a list of the most important activities and documents related to those environmental issues with short commentary.

- My June 9, 2003 letter to you provided a review of the first set of data provided by NCR that relates to Old River Fields. In that letter I addressed the concern for "Protection of the Oakwood residents who use the athletic fields." At that time there was one soil sample adjacent to the parking lot with an elevated lead level of 770 mg/kg which is less than twice the Residential Direct Contact Standard of 400 mg/kg that was developed from assuming an ingestion exposure for 350 days per year every year for 6 years as a child plus 24 years as an adult. Arsenic was also elevated above the Residential Direct Contact Standard of 6.8 mg/kg. As with lead, the exposure route would be long term ingestion. My letter recommended requesting additional information from NCR.
- My September 8, 2003 letter to you provided a review of the additional information provided by NCR by letter of August 22, 2003. The additional soil samples for lead showed lower levels than the one "hot spot" previously found. NCR also provided a risk analysis for lead that conservatively assumes exposure for a child between birth and 7 years of age playing on the soccer fields four hours per day, five days a week. The allowable lead concentration under this scenario was determined to be 1,040 ppm, which is well above the highest lead level found at Old River Fields. The letter also found that the levels of arsenic and volatile organic compounds in the groundwater found to date "are not a health risk to people using the athletic fields." However, my letter did recommend requesting that "NCR make available any future information obtained regarding the distribution and/or source of contamination in the vicinity of MW-601."

- During August and September 2006, LJB prepared a Phase I Environmental Site Assessment (ESA) for “NCR Recreational Fields, Part Parcels R72-30-7-1 and -2” that was issued to the City of Oakwood on October 9, 2006. Note that a Phase I site assessment, as defined in ASTM E1527 is an evaluation of existing information, such as public records, aerial photos, etc. and a site visit to note any visual evidence pointing to potential sources of contamination. A Phase I ESA does not involve sampling of soil, water or air. A purpose of a Phase I ESA is to identify “recognized environmental conditions.” Note that the existence of “recognized environmental conditions” does not mean, or even imply, that there is a threat to human health or the environment (see attached document titled “Recognized Environmental Conditions” dated 9/14/10). The existence of such recognized environmental conditions points to the items a potential purchaser should consider prior to taking possession of the land.

As noted in the ESA, the recreational use of this land began in approximately 1938 and the use has remained recreational since then. Prior to construction of the athletic fields, the only other previous use identified was a community gardens. In this ESA, there were three items identified as “recognized environmental conditions.” These were 1) the elevated lead and arsenic levels in various soil samples, 2) trichloroethene (TCE) above the MCL in groundwater samples in several monitoring wells, and 3) *cis* 1,2 dichloroethane above the MCL in one groundwater sample. The ESA concluded that “because the groundwater is not used as drinking water, the levels present (of both volatile organic compounds) are not considered sufficient to result in a threat to human health or the environment, or to migrate off the subject property.” Informed by the ESA, the City of Oakwood proceeded with the purchase of the Old River Athletic Fields.

- On November 20, 2006, Channel 7 TV (WHIO) aired a news story identifying the Oakwood soccer fields as having arsenic and lead contamination.
- On the evening of November 20, 2006 the City of Oakwood Board of Health held a public session, recorded in part by Channel 7 TV, at which the arsenic and lead issue at the soccer fields was discussed. During that session I presented an “Evaluation of Risk Based Concentrations for Chronic Exposure to Arsenic” that qualified LJB staff had prepared. That evaluation emphatically demonstrated that the arsenic levels found at Old River Athletic Fields were not a health risk to children playing on the soccer fields. I also reported on the earlier risk-based evaluation of lead done in 2003.
- My June 30, 2010 letter responded to your request for an update on the 2006 Soccer Field Phase I ESA. This evaluation concluded that all new information obtained since 2006 supported the conclusions and recommendations of the 2006 ESA. The letter concluded with “In summary, it is my professional opinion that there is no danger to the public, and specifically no danger to children, using the Old River soccer fields from the types and amounts of chemicals that have been found there. However, LJB does recommend continued review and evaluation of all new information and data as they become available.”

Exposure Routes for Environmental Contaminants

For contaminants, either petroleum products or hazardous substances, to be a threat to human health or the environment there must be a route by which humans or other organisms are exposed to the contaminants at concentrations high enough to pose a threat. The various possible exposure routes related to the contaminants found on, under or in the vicinity of Old River Athletic Fields are discussed in this section.

- Inhalation - For materials to be inhaled (breathed in) they must be airborne either by being gases or by being suspended particulates (e.g. dust or aerosols). To be an inhalation risk a contaminant

must be airborne at concentrations high enough to pose a threat. Looking at the various contaminants found at the soccer fields, the following points are made.

- Arsenic and lead do not exist as gases and are found associated only with soil at the soccer fields.
- As long as the soil based lead and arsenic are kept below a sod layer and there is no dust created they cannot pose a threat.
- Low level VOCs as found in groundwater at the soccer fields can conceivably enter the gas phase and migrate to the ground surface. However, once at the ground surface the very low levels of contaminant gases would very quickly disperse. Therefore, there is no threat from inhalation of the VOCs.
- Dermal Contact - For materials to be a threat to exposure through the skin, they have to have properties that allow passage through the skin, there must be direct contact with those materials, and the contaminants must be in high enough concentrations to pose a risk.
 - Arsenic and lead at low levels in the soil are not absorbed through the skin.
 - There is no possibility of direct skin contact with the VOCs in the groundwater and the concentrations beneath the soccer fields are too low to be a threat even if there was direct contact.
- Ingestion - Ingestion involves eating or drinking the contaminants.
 - Contaminants in the groundwater (e.g. the VOCs) are not an ingestion threat because no one has access to the groundwater under the site and that groundwater is not used as a drinking water source.
 - Regarding the arsenic and lead found in the soils at the soccer fields, these contaminants have been shown in the risk evaluations discussed above to be below the levels that would pose a threat to human health.
 - For surface water flow to pose an ingestion risk at the soccer fields, the storm water would have to be exposed to sources of contaminants, the contaminants would have to dissolve in the water in high enough levels to pose a threat, and the storm water would have to actually reach the soccer fields and then be ingested.

Other Factors Related to Possible Contaminant Exposure at the Athletic Fields

Concerns have been expressed by Oakwood citizens that contamination from past NCR activities on properties surrounding the athletic fields could pose a threat to the health of people, especially children, playing there. In this section these specific concerns are addressed.

- A concern that the former Miami and Erie Canal has been filled with unknown material, possibly foundry waste containing contaminants. What is known so far does not indicate a significant threat to the soccer fields.
 - The one place where recent construction activity has excavated the old canal just southeast of the intersection to the new soccer field drive found no industrial or foundry waste as fill. Another canal crossing will be excavated at the time that the sanitary sewer is extended west and this excavation will be closely monitored for type of fill material.

- The canal was constructed with banks of clay material so that water would be kept in the canal in order to function as designed. These clay banks tend to hold any materials within the canal and prevent or attenuate their migration.
- If the former canal were a significant source of possible contamination, then it would be expected that those contaminants would have showed up in the groundwater under the soccer fields given that the material had to be there for more than 30 years.
- A concern that the former drum storage area east of the soccer fields and the past storage of drums along the access road east and south of the soccer fields has caused soil and groundwater contamination that might impact the soccer fields.
 - The known soil and groundwater contamination on the land still owned by NCR, known as Area 6, is on the opposite side of the former canal from the soccer fields. Since the contaminant release had to have occurred more than 30 years ago, the low level of groundwater contamination at the soccer fields compared to that in Area 6 indicates a very low rate of groundwater migration toward the soccer fields.
 - The presence of *cis* 1,2 dichloroethane and vinyl chloride in the groundwater samples indicates that biological degradation of TCE is occurring. Over time this will reduce and ultimately eliminate these contaminants. Biological degradation of the slowly moving groundwater plume may be a significant factor in the low levels found under the soccer fields.
 - The very low levels of VOCs under the soccer fields could also be a result of the clay canal walls forming a barrier, or partial barrier, to the migration of contaminants toward the soccer fields.
- A concern related to a storage area for cyanide, acids and ammonia to the east of the soccer fields. Since all of these materials have very rapid reaction and/or degradation rates, there will not be any residuals left since the sources were removed long ago. So this is a non-issue as far as being a current threat to the soccer fields.
- A concern related to the former carbonless paper factory north of the soccer fields where PCB and cyclohexane releases have been identified.
 - The evidence from the reports I have seen is the releases are contained to the site and have not migrated off site. At this time the area is covered by an asphalt parking lot so there is no exposure to storm water.
 - No PCBs or cyclohexane have been detected under the soccer fields so those contaminants have not migrated to the soccer fields via the groundwater.
 - The property is now owned by the University of Dayton so responsibility for dealing with any contamination on that property now lies with them. If there is construction activity involving excavations on that site, the City of Oakwood would have a legitimate interest in preventing contaminant migration toward the soccer fields.
- A concern that an area north of the UD tennis courts is reportedly filled with “drums and other potentially contaminated materials.”
 - I am interested in the source of this information since I am not at this time aware of such an area so I am not able to evaluate the risk to the soccer fields.

- At this time the area is apparently covered with an asphalt-paved parking lot so the exposure to people using the soccer fields would be low. However, future excavation could pose risks that would be of interest to the City of Oakwood.

Summation

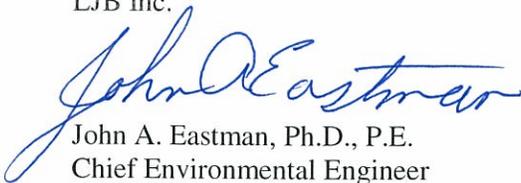
While it is well established that there are known contamination sources at various locations around the soccer fields, there is no evidence of a threat from any of these sources to the health and safety of the children playing there. The mere existence of contamination does not imply it is a threat. The existence of contamination means it must be evaluated to determine if it actually poses a threat to human health or the environment.

My examination of the evidence leads me solidly to reiterate my past conclusions that the Old River Athletic Fields are safe and there is no threat to the health of the children playing there.

As always I am open to receiving, reviewing and evaluating new information. So far I have no new information from what has long been available to me in making my recommendations to the City of Oakwood.

Sincerely,

LJB Inc.



John A. Eastman, Ph.D., P.E.
Chief Environmental Engineer