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# Technical Assistance Services For Communities

## Technical Review for Springfield Schools Site

### February 2012 Fact Sheet

#### Introduction

This fact sheet pertains to a review of documents regarding environmental conditions at the Anthony Carnevale Elementary School and Del Sesto Middle School, which were constructed between 1999 and 2000. The location of the schools was used as a landfill during the late 1960s and early 1970s. Prior to construction of the schools, environmental testing identified the presence of approximately 200,000 cubic yards of solid waste. Three major “constituents of concern” were identified from initial soil, ground water and air samples. These were lead, arsenic and total petroleum hydrocarbons (TPH). At an earlier time, Rhode Island Department of Environmental Management (RI DEM) also found polychlorinated biphenyls (PCBs) on the Site. Ongoing monitoring and maintenance activities are conducted to protect those who occupy the buildings and use the property from exposure to harmful substances.

This fact sheet is provided by the U.S. Environmental Protection Agency (EPA)’s Technical Assistance Services for Communities (TASC) program, which is implemented by independent technical and environmental consultants. Its contents do not necessarily reflect the policies, actions or positions of EPA. TASC activities are meant to empower community members to more effectively participate in environmental decision-making processes within their communities.

This fact sheet summarizes the recommendations developed from the review. Details of the review can be viewed in a longer document that includes greater detail of each step of the review.

At the request of the Environmental Justice League of Rhode Island, the TASC team completed the following activities:

- Reviewed RI DEM’s *Draft Five-Year Review (FYR) Report, Anthony Carnevale Elementary School and Del Sesto Middle School*.
- Reviewed key documents upon which remedial actions were based, including the 1999 Site Investigation report (SI), Supplemental SI reports, and Remedial Action Work Plan (RAWP) and Order of Approval.
- Reviewed periodic monitoring reports.
- Reviewed the court order establishing the FYR.
- Conducted a site visit with community representatives.
- Prepared written comments on the RI DEM Draft FYR, including any recommendations for changes to the approved remedial actions for the Site.

The purpose of the report is to provide the Environmental Justice League of Rhode Island and community members in Providence, Rhode Island with an understanding of the technical merit of the FYR and an independent review of the remedial activities so that they have sufficient information to provide their own comments to RI DEM during a public comment period for the Draft FYR report.

## TASC Recommendations

Landfill settling and potential for landfill gas (LFG) infiltration into the school buildings will be an ongoing problem at this Site for many years. The soil cap and sub-slab ventilation system will continue to require diligent monitoring and maintenance to protect children and adults from exposure to harmful substances.

TASC recommends:

- That an updated evaluation of the potential for releases of LFG into nearby residences be conducted.
- Review of whether sulfur-containing substances (carbon disulfide and methyl mercaptans) should be added to quarterly laboratory analyses, as these are common LFGs. There is no record that these gases have ever been included in laboratory analyses of soil gases from the Site. Also, review if laboratory analyses should include the other 6 common LFGs listed and discussed on page 11 of the longer report.
- That quarterly laboratory analyses of soil gas samples include hydrogen sulfide.
- That future quarterly monitoring reports state whether or not the specific volatile organic compounds (VOCs) detected by laboratory analysis in previous soil gas samples are also detectable by the photoionization detector (PID) used for field screening of soil gas and indoor air.
- That future quarterly monitoring reports be revised to reflect the actual indoor air Remedial Action Work Plan (RAWP) action levels for methane (500 ppm) and hydrogen sulfide (currently 5 ppm), and appropriate actions to be taken if the specified RAWP action level is exceeded.
- That the City or DEM create a graphical display of laboratory results for each soil gas analyte over time to evaluate any decreasing or increasing trends.
- That the RAWP action level for hydrogen sulfide in indoor air be lowered to no more than 2 ppm – the concentration that the World Health Organization reports as causing bronchial constriction in asthmatic individuals.
- That the City or DEM create a graphical display of laboratory results for each of the six gases measured over time at each location to evaluate any decreasing or increasing trends.
- Because the problem seems to be consistent over several years, TASC recommends that the sub-slab ventilation system be examined by a qualified engineer and appropriate equipment changes be made to solve the problem of frequent shutdown of the ventilation system blowers due to water accumulation in the knockout tanks (i.e., moisture separator tanks). Equipment changes could include adding a high water alarm in the knockout tanks or resizing the knockout tanks.
- If not already occurring, that custodial staff and other appropriate school employees receive annual hazard recognition training with respect to Site conditions and sub-slab ventilation system operation from a qualified instructor.
- That a review of RI DEM reporting requirements be given to appropriate school personnel. [In the section discussing maintenance personnel interviews, a maintenance personnel at the middle school “observed a complete hole in the cap near the back of the middle school building which resulted in exposure of the orange snow fence at the base of the cap.” Because this occurrence was not dated, TASC was unable to determine if it was reported appropriately.]

## Comments on FYR

TASC agrees with the recommendations in the FYR report. These recommendations include:

- Inspection of the soil cap every two weeks and repair of observed cavities by filling and thorough compaction of fill soil immediately.
- Regular inspections and maintenance of the HVAC systems for the schools to ensure optimum indoor air quality, including carbon dioxide levels.
- Confirmation of a measurable vacuum in the subsurface environment throughout the Site to support a definitive conclusion that the systems are effectively preventing migration of subsurface vapors into indoor air.
- Actions to reduce the recurrence of sub-slab ventilation system shutdowns. These actions could include more frequent inspections, adjustments to the ventilation system, resized equipment, mechanical controls or alarms.

With regard to improving the FYR report, TASC recommends:

- Specifically listing the questions required to be answered in terms of the statement of protectiveness and addressing each of these questions:
  - *Is the remedy still functioning as designed?*
  - *Is there any reason to believe that exposure assumptions, toxicity data and remedial objectives used at time of remedy selection are not still valid?*
  - *Has any new information come to light that may impact the protectiveness of the remedy?*
- Adding a discussion of the terms and current status of the Environmental Land Usage Restriction.
- Presenting monitoring data quantitatively in the FYR report. Tabulated data can be included in an appendix.
- Reviewing and discussing the validity of 1999 RAWP action levels for indoor air and soil gas screening identified in the Operation and Maintenance (O&M) Plan.

Questions? Contact:

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## Questions

TASC was asked to address the following concerns expressed by community members:

1. *Is it possible that contaminants in the subsurface are moving into the soil cap?*

TASC response: This is a reoccurring community concern because of probable direct contact of children with the surface soils. Movement of contaminants in the environment depends on the characteristics of the specific contaminants, as well as the characteristics of the soil, rocks and ground water in the subsurface. It is conceivable that certain contaminants may move in an upward direction if present in soil pore water or as gases. Solid contaminants are not likely to move upward into the clean soil cap. Although it seems unlikely that contaminants are moving upward into the clean soil cap, this concern could be alleviated by testing a few surface soil samples for chemicals of concern.

2. *Is it possible that contaminated ground water is interacting with areas of standing surface water frequently found on the Site between the two school buildings?*

TASC response: This is an area of community concern because of probable direct contact of children with standing surface waters. It is unlikely that ground water is causing contamination of surface water by interacting with the surface water or by ground water coming to the surface. However, after large rain events under certain conditions, ground water can be forced to the surface. We do not know if this is happening at this Site. This community concern could be alleviated by taking a grab sample of the standing surface water in the area between the two school buildings and testing the water for contaminants of concern.

3. *Is the weight of the buildings causing soil compression to the extent that it is causing an effect on the ground water in the perched aquifer on the Site?*

TASC response: While the weight of the building will cause some soil compression, it is unlikely that the weight of the building is affecting the perched aquifer.

4. *Is tree death caused by the contaminants on the Site?*

TASC response: This question is discussed in Section 3.1.2 of the FYR as a response to a public comment where maintenance personnel stated they believed that the incidents of dead plants may have been due to the lack of an irrigation system at the Site and insufficient watering. While TASC does not know the specific cause of the death of the trees on Site, it is unlikely that it is caused by interaction with the contaminants.

5. *Can cracks in the school foundation disturb the vacuum on the vapor mitigation system?*

TASC response: It is unlikely that cracks in the foundation will impact the vacuum pressure of the vapor mitigation systems, as they are not gaping holes and likely are not entirely through the foundation material. As recommended in the FYR, confirmation of a measureable vacuum in the subsurface environment throughout Site would support a definitive conclusion that the systems are effectively preventing migration of subsurface vapors into indoor air and that cracks in the foundation are not disturbing the vacuum seal.