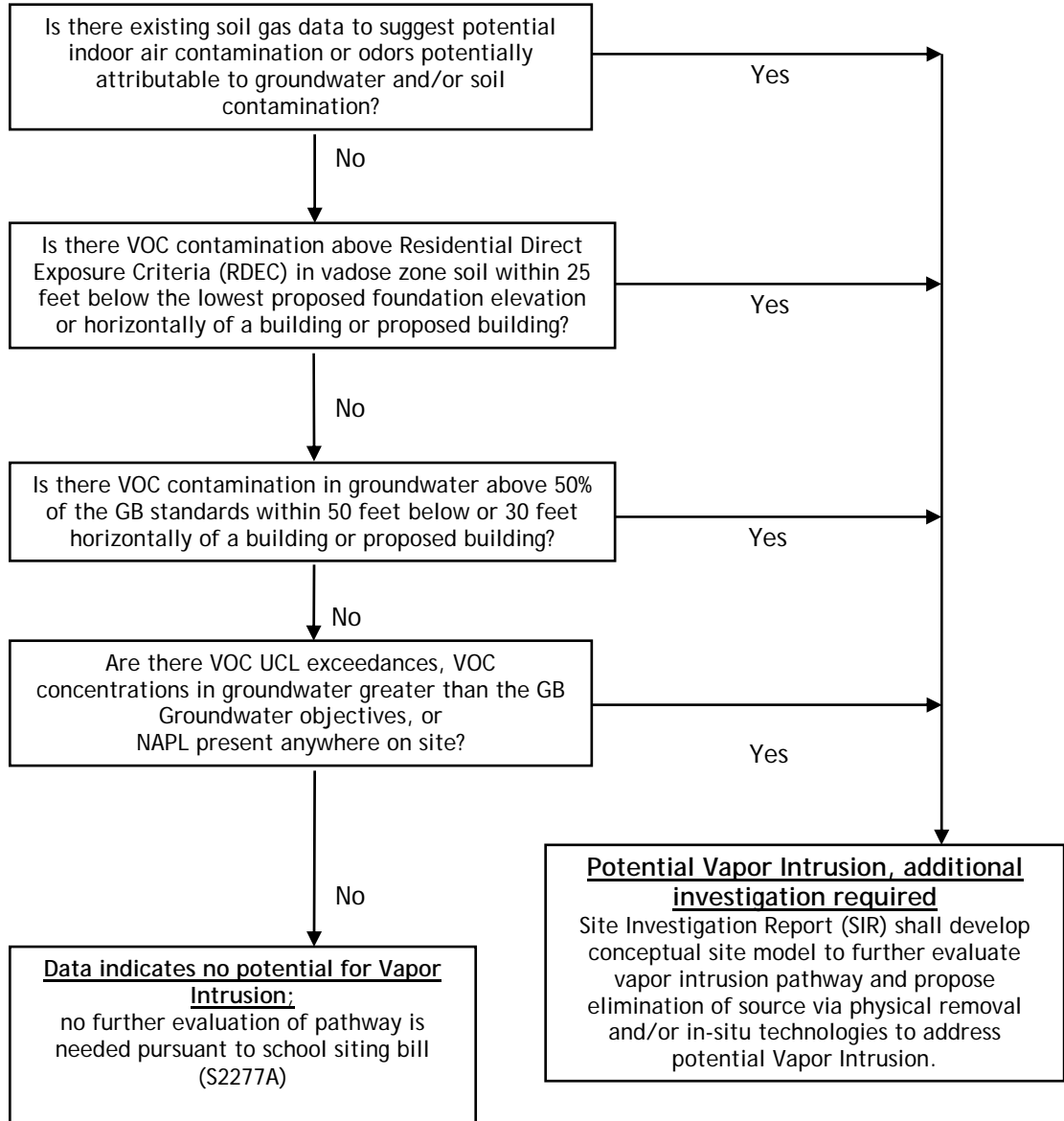


## Evaluation of Vapor Intrusion Potential for Proposed RI School Sites

- Initial site screening must include soil, groundwater, and soil gas sampling and laboratory analysis for Volatile Organic Compounds (VOCs) for any proposed School locations.



\*While indoor air sampling is not a required part of this evaluation, indoor air sampling may be warranted prior to use of an existing building as a school in order to evaluate for structural contamination, radon, mold, ventilation issues, etc.

9/19/12

**RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF WASTE MANAGEMENT**

**SCHOOL SITING GUIDANCE  
FOR THE EVALUATION OF VAPOR INTRUSION POTENTIAL  
IN PROPOSED RHODE ISLAND SCHOOL SITES**

On June 6, 2012, a new law took effect that impacts the siting, leasing, and construction of school buildings (public, private, or charter) on contaminated sites in Rhode Island. The RI Department of Environmental Management (RIDEM) regulates the cleanup and re-use of contaminated sites under the authority of [RIGL Chapter 23-19.14](#) entitled "Industrial Property Remediation and Reuse Act" and other related Chapters. This law applies specifically to school **buildings**, and does not affect the current processes in place to construct components related to school complexes, located outside of buildings, such as outdoor recreation areas, parking lots, gardens, and other landscaped areas.

The following is a step-by-step process of evaluating the potential for vapor intrusion to migrate from the subsurface into an existing or proposed building to be used as a school:

- Prior to going through the steps in the flow chart, an initial screening of a property proposed to be a school must (instead of "should") include soil, groundwater, and soil gas sampling for laboratory analysis for Volatile Organic Compounds (VOCs). The Department strongly recommends that a meeting be held prior to sampling to discuss the approach/strategy proposed for the investigation to determine if the locations and number of samples is sufficient to validly support the decisions required in this analysis.

**STEPS IN THE FLOW CHART:**

**STEP 1:** The first step in the flow chart asks the question: **"Is there existing soil gas data to suggest potential indoor air contamination or odors potentially attributable to groundwater and / or soil contamination?"** This step requires comparing any contaminants found in the initial soil, groundwater and soil gas samples to each other to see if there are any similarities in the contaminants found relative to the other media. That is to say that if VOCs are detected in soil gas, are the same contaminants found in nearby soil or groundwater? If the answer to this question is **"NO,"** move on to **STEP 2.** If the answer to this question is **"YES,"** the rest of the steps in the flow chart shall be skipped, and the Performing Party shall be required to complete a Site Investigation Report (SIR) which includes a Conceptual Site Model to further evaluate the vapor intrusion pathway. The SIR shall also propose the elimination of the source via physical removal and/or in-situ technologies to eradicate the potential for Vapor Intrusion into Indoor Air. This requirement will be discussed in further detail at the end of the step process in the flow chart.

**STEP 2:** The second step in the flow chart asks the question: **“Is there VOC contamination above Residential Direct Exposure Criteria (RDEC) in vadose zone soil within 25 feet below the lowest proposed foundation elevation or horizontally of a building or proposed building?”** The vadose zone is the unsaturated zone between the ground surface and the top of the water table through which soil gas can move throughout the pores in the soil. In this step, the analytical results of the soil samples collected from the vadose zone for VOCs are compared to the Residential Direct Exposure Criteria (RDEC) found in Table 1 of the Remediation Regulations. If the results of samples collected within 25 feet below the existing or proposed building foundation or within 25 feet of the side of the existing or proposed building, are greater than any of the RDECs for VOCs, the Performing Party is required to complete an SIR with a Conceptual Site Model (CSM) because the potential for vapor intrusion exists. If the analytical results are less than the RDECs for VOCs, the Performing Party may move to the next step.

**STEP 3:** The third step in the flow chart asks the question: **“Is there VOC contamination in groundwater above 50% of the GB standards within 50 feet below or 30 feet horizontally of a building or proposed building?”** Groundwater classified ‘GB’ is defined by RIDEM’s Groundwater Quality Rules as “those groundwater resources designated by the Director which may not be suitable for public or private drinking water use without treatment due to known or presumed degradation.” The GB Groundwater Objectives in the Remediation Regulations were developed based upon the consideration of the potential for volatilization of groundwater into indoor air (i.e. vapor intrusion). This step requires the groundwater analytical results collected within 50 feet below the existing or proposed building foundation or within 30 feet of the side of the existing or proposed building be compared to fifty percent (50%) of the GB Groundwater Objectives. If the analytical results are greater than 50% of the GB Objectives for any constituents, the Performing Party is required to complete an SIR with a Conceptual Site Model (CSM) because the potential for vapor intrusion exists. If the analytical results are less than 50% of the GB Objectives for all constituents, the Performing Party may move to the next step of the flow chart.

**STEP 4:** The fourth and final step of the flow chart asks the question: **“Are there VOC UCL exceedances, VOC concentrations in groundwater greater than the GB Objectives, or NAPL present anywhere on site?”** In the Remediation Regulations, the acronym “UCL” stands for Upper Concentration Limit, and is applied to soil, sediments and water that have concentrations of Hazardous Substances, or petroleum, which if exceeded, may demarcate a transition between contaminated environmental media and waste in the environment. “NAPL” is an acronym for Non-Aqueous Phase Liquids and is considered a condition that exceeds UCLs in any environmental medium. The goal of this question is to determine whether or not there are high levels of VOCs in soil and / or groundwater on a potential school property that falls outside the boundaries established in Steps 2 and 3. The first part of the question asks the Performing Party to compare the soil and groundwater analytical results to the UCLs as defined in Section 8.07 of the Remediation Regulations and determine if there are any exceedances. The second part of the question is looking for a comparison of the groundwater analytical results to the GB Groundwater Objectives to determine if the GB Objectives are exceeded. The final part of this step is a determination of whether or not NAPL exists in any environmental medium on the property. If the answer to all of the requirements in **STEP 4** is “NO,” the determination can be

made that the Data Indicates That There is No Potential for Vapor Intrusion and that no further evaluation of the vapor intrusion pathway is needed pursuant to the school siting bill.

If the answer to any of the questions in the four steps above is “YES,” the determination is made that the Potential for Vapor Intrusion exists and that additional investigation and remediation is required if the reuse of the property is to be a school. A Conceptual Site Model (CSM) must be developed to further evaluate the Vapor Intrusion Pathway, and a complete Site Investigation Report that includes Remedial Alternatives, such as source removal and groundwater treatment, must be written. These two documents must be submitted for review and approval by the Department and must explain why the proposed remedy(s), once implemented, will eliminate the potential for vapor intrusion. If the Department does approve the proposed remedy(s), the approval to put a school on the property is still conditional on the final outcome resulting in the removal of the ongoing potential for vapors or gases to migrate into the building from the subsurface. After the implementation of the DEM approved remedial action, the Performing Party must collect new samples and re-evaluate the Vapor Intrusion Potential using the attached flow chart.



**RHODE ISLAND**  
**DEPARTMENT OF ENVIRONMENTAL MANAGEMENT**  
235 Promenade Street, Providence, RI 02908  
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New Law Impacting Siting of School Buildings on Contaminated Property in RI  
*July 2012*

On June 6, 2012, a new law took effect that impacts the siting, leasing, and construction of school buildings (public, private, or charter) on contaminated sites in Rhode Island. The RI Department of Environmental Management (RIDEM) regulates the cleanup and re-use of contaminated sites under the authority of [RIGL Chapter 23-19.14](#) entitled "Industrial Property Remediation and Reuse Act" and numerous other related Chapters. This law applies specifically to school buildings, and does not affect the current processes in place to construct non-structural components related to school complexes, located outside of buildings, such as outside recreation areas, parking lots, gardens, and other landscaped areas.

Copies of the recently enacted bills can be found at:

S-2277Aaa: <http://www.rilin.state.ri.us/BillText/BillText12/SenateText12/S2277Aaa.pdf>  
H-7412: <http://www.rilin.state.ri.us/BillText/BillText12/HouseText12/H7412.pdf>

This new law, which amends *RIGL §23-19.14-4*, took effect upon passage and is comprised of 2 parts:

- Sites with Vapor Concerns -
  - The new law prohibits the siting of school buildings on properties that pose an ongoing potential for vapor intrusion upon occupancy. Vapor intrusion is a process by which chemicals in soil and/or groundwater migrate into the indoor air above a contaminated site. This provision applies to the construction of any new school building, the construction of an addition to any existing school building, or the leasing of any portion of an existing building to serve as a school. Further discussion with an environmental consultant about the complexities of sites/buildings with vapor intrusion challenges is recommended.
- Requirement for Reports, Public Hearing & Public Comment -
  - The new law prohibits the construction of any new school building, the construction of an addition to any existing school building, or the leasing of any portion of an existing building to serve as a school on any portion of a parcel of property formerly used for industrial, manufacturing or landfill purposes that is contaminated by hazardous materials (other than a vapor intrusion site as identified above) unless the sponsor of the school project:
    - Prepares a report, made available on the sponsor's website, for public comment that: i) outlines the projected cost of acquiring and cleaning up and monitoring the site in accordance with [RI's Remediation Regulations](#); ii) projects the time required to clean up the site; and iii) discusses the rationale for selecting a contaminated property for use as a school and an explains any alternatives to selecting said property considered by the sponsor of the school project.
    - Solicits written comment on the report for a period of at least 30 days.
    - Conducts a public hearing, at which time comment will be taken on the report.
    - Prepares a second report, made available on the sponsor's website, summarizing and responding to comments received from the public.

The sponsor shall consider the findings of the report and comments when making a final site selection.

This new law defines the term “school” as any residential or non-residential school building, public, private or charter, of any city or town or community educational system regulated, directly or secondarily, by the Board of Regents for Elementary and Secondary Education or the Department of Elementary and Secondary Education, or any other state education board, or local city or town school board, or school committee, or other legal educational subdivision acting under it. The term "school" includes, but is not limited to, school playgrounds, school administration buildings, indoor school athletic facilities, school gymnasiums, school locker rooms, and similar school buildings. It does not include any institutions for education of adults (e.g. colleges, universities, graduate schools, trade schools) or child-care facilities as regulated by the Department of Children, Youth and Families.

*RIGL Chapter 23-19.14* already included special requirements for the cleanup and redevelopment of sites that are known to be contaminated or suspected of being contaminated based upon past use when considered for possible reuse as the location of a school, child-care facility, or as a recreational facility for public use (adopted in 2006 and found in [RIGL §23-19.14-5](#)). The new law enacted by the General Assembly in June 2012 adds to the level public participation and dialogue that is required to occur when school buildings on contaminated sites are being proposed. It is not intended to supersede the existing requirements in place since 2006.

The siting of schools is a particularly sensitive issue for local municipalities, parents and students alike. It is even more sensitive if contamination is detected on a site selected as the possible location for a school building.

As such, RIDEM encourages municipalities and other entities that may be planning future school construction projects in RI to review the new law and determine how it may impact the site selection process and/or construction timelines. If real construction has already started or a lease has been executed prior to the date of passage of this new law, this new law does not apply.

RIDEM intends to adopt regulations to further clarify some of the specific terms and phrases used in this new law.

***This document is provided as a courtesy only and is intended to provide individuals and entities with basic information about a recently adopted law. Please refer to the enacted legislation and/or Public Law for purposes of compliance.***

***Compliance with applicable laws is the responsibility of each individual or entity.***

**2012 -- S 2277 SUBSTITUTE A AS AMENDED**

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LC01040/SUB A  
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**STATE OF RHODE ISLAND**

**IN GENERAL ASSEMBLY**

**JANUARY SESSION, A.D. 2012**

—————  
A N A C T

RELATING TO HEALTH AND SAFETY - ENVIRONMENTAL CLEAN UP OBJECTIVES  
FOR SCHOOLS

Introduced By: Senators Pichardo, Jabour, Metts, Picard, and Crowley

Date Introduced: February 01, 2012

Referred To: Senate Environment & Agriculture

It is enacted by the General Assembly as follows:

1           SECTION 1. Section 23-19.14-4 of the General Laws in Chapter 23-19.14 entitled  
2 "Industrial Property Remediation and Reuse Act" is hereby amended to read as follows:

3           **23-19.14-4. Objectives of environmental clean-up.** – (a) The department of  
4 environmental management will develop, maintain and publish numerical objectives for the most  
5 commonly found hazardous substances. These objectives will be applicable for the clean-up of  
6 contaminated properties to levels which are protective of human health and the environment  
7 based on current and reasonably foreseeable future use of a property and the surrounding natural  
8 resources.

9           (b)(1) The construction of any new school building; or

10           (2) Construction of an addition to any existing school building; or

11           (3) Leasing of any portion of an existing building to serve as a school, shall be prohibited  
12 on any portion of a parcel of property for which, upon occupancy, there exists an ongoing  
13 potential for hazardous materials and/or petroleum to migrate as vapors or gases into the building  
14 from the subsurface of the parcel of property, including any potential failure of engineered  
15 remedies to address said vapors or gases.

16           (c) The construction of any school building, or construction of an addition to any existing  
17 school building, or leasing of any portion of an existing building to serve as a school on any  
18 portion of a parcel of property formerly used for industrial, manufacturing or landfill purposes

1 that is contaminated by hazardous materials, other than on a parcel of property described in  
2 subsection (b) of this section, shall be prohibited unless at least thirty (30) days prior to selecting  
3 the location for construction or leasing the building the project sponsor undertakes all of the  
4 following measures with ten (10) days prior written notice to the public of each measure  
5 undertaken:

6 (1) Prepares and posts on the sponsor's website a written report that: (i) Projects the costs  
7 to acquire or lease the property, and to cleanup and maintain the property in accordance with the  
8 department of environmental management's Rules and Regulations for the Investigation and  
9 Remediation of Hazardous Material Releases (the Remediation Regulations); (ii) Projects the  
10 time period required to complete a cleanup of the property for school purposes prior to occupancy  
11 by obtaining either a Letter of Compliance from the department of environmental management or  
12 a determination by said department that the property is not jurisdictional under the Remediation  
13 Regulations; (iii) Discusses the rationale for selecting the property for use as school purposes and  
14 an explanation of any alternatives to selecting said property considered by the project sponsor;

15 (2) Solicits written comments on the report prepared pursuant to subdivision (1) of this  
16 subsection for a period of at least thirty (30) days after posting said report on the sponsors website  
17 and conducts a public hearing during said thirty (30) day period at which public comment is taken  
18 on said report; and

19 (3) Prepares a second written report that summarizes and responds to the public  
20 comments received during the public comment period and at the public hearing and posts said  
21 second report on the sponsor's website.

22 (d) The sponsor of any school project subject to the provisions of subsection (c) of this  
23 section shall consider the results and findings contained in the reports required by subsection (c)  
24 when selecting the location of said project.

25 (e) As used in this section.

26 (1) The term "school" means any residential or non-residential school building, public,  
27 private or charter, of any city or town or community educational system regulated, directly or  
28 secondarily, by the board of regents for elementary and secondary education or the department of  
29 elementary and secondary education or any other state education board or local city or town  
30 school board or school committee or other legal educational subdivision acting under it. As used  
31 in this chapter, the term "school or schools" includes, but is not limited to, school playgrounds,  
32 school administration buildings, indoor school athletic facilities, school gymnasiums, school  
33 locker rooms, and similar school buildings. A school shall not include any institutions for  
34 education of adults (e.g. colleges, universities, graduate schools, trade schools) or child-care



1 [facilities as regulated by the department of children, youth and families.](#)

2 [\(2\) The term "landfill" means for purposes of this section, any portion of a parcel of](#)  
3 [property that was used as a landfill as defined in section 23-19.1-4 or a sanitary landfill, dump or](#)  
4 [other disposal area where more than thirty \(30\) cubic yards of solid waste was disposed.](#)

5 [\(3\) The term "hazardous materials" means any materials defined as hazardous materials](#)  
6 [pursuant to section 23-19.14-3.](#)

7 [\(4\) The term "solid waste" means any materials defined as solid waste pursuant to section](#)  
8 [23-18.9-7.](#)

9 SECTION 2. Section 16-9-4.1 of the General Laws in Chapter 16-9 entitled "School  
10 Funds and Property" is hereby amended to read as follows:

11 **16-9-4.1. New school construction -- Regulations for technology requirements. --** (a)

12 The department of elementary and secondary education is instructed to develop regulations to  
13 ensure that any city, town, or district which undertakes "new school construction" as defined in  
14 this section provides in the planning for necessary wiring which is consistent with current  
15 standards for computer networking technology in schools.

16 [\(b\) The sponsor of any new school construction project or any school project involving](#)  
17 [the leasing of any portion of an existing building for use as a school shall also comply with the](#)  
18 [requirements for schools set forth in section 23-19.14-4.](#)

19 ~~(c)~~ For the purposes of this section, "new school construction" means: (1) Any new  
20 school buildings.

21 (2) Additions of any new classrooms to existing school buildings.

22 SECTION 3. This act shall take effect upon passage.

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LC01040/SUB A  
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EXPLANATION  
BY THE LEGISLATIVE COUNCIL  
OF

A N A C T

RELATING TO HEALTH AND SAFETY - ENVIRONMENTAL CLEAN UP OBJECTIVES  
FOR SCHOOLS

\*\*\*

- 1            This act would provide further regulation of the use of former hazardous material sites for
- 2 new construction.
- 3            This act would take effect upon passage.

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LC01040/SUB A  
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