

## PART A GENERAL COMMENTS

### A.1 TOPIC: New York State Department of Health's (NYSDOH's) authority to issue guidance

Comment A.1.1 (paraphrased, 2 commenters, 7 comments):

The NYSDOH's guidance does not identify the statutory authority on which it is based, or explain how it implements a statutory scheme. The NYSDOH lacks the statutory authority to implement guidance concerning environmental cleanup.

Response A.1.1:

The NYSDOH has substantial authority to issue guidance for evaluating soil vapor intrusion. The sources of this authority are provisions of the Public Health Law (e.g. Sections 206(1)(a), 206(1)(d), 201(1)(n), 1300(1), 1389-b(1)(a), 1389-b(2), 1389-b(3)), the Environmental Conservation Law (e.g. Sections 27-1305(2)(b), 27-1415(4), 27-1415(7)(c), 27-1415(9)) and the Navigation Law (e.g. Sections 177-a(4) and (5)), which empower the NYSDOH to respond to conditions, including soil vapor intrusion, that may adversely affect public health. The statutory authority empowers the NYSDOH to assess and address threats to the public health, nuisances, inactive hazardous waste disposal sites, brownfield sites and petroleum discharges. The NYSDOH regularly investigates, assesses and participates in the development of response actions at sites where soil vapor intrusion has been identified. The NYSDOH's authority to issue guidance for evaluating soil vapor intrusion is implicit in this statutory authority. The guidance does not exceed the NYSDOH's authority or impermissibly intrude upon the purview of the New York State Department of Environmental Conservation (NYSDEC).

### A.2 TOPIC: NYSDOH's guidance is a rule or regulation

Comment A.2.1 (paraphrased, 3 commenters, 5 comments):

The NYSDOH's guidance is a rule or regulation under the New York State Administrative Procedure Act that is subject to the substantive and procedural requirements of that act. The guidance sets a standard of conduct that is applicable in all circumstances. Many provisions of the document are non-discretionary, mandatory compliance requirements. The guidance is a rule because its use of the term "must" and other prescriptive requirements demonstrate that it is a fixed general principle applied without regard to other facts and circumstances.

Response A.2.1:

The February 2005 draft of the guidance does not constitute a rule or regulation because it is not a "fixed, general principle to be applied by an administrative agency without regard to other facts and circumstances...." [Reference: Roman Catholic Diocese of Albany v. New York State Department of Health, 66 NY2d 948, 951 (1985)]. See, for example, the following:

- Section 1.5 — "[s]ince no two sites are exactly alike, the approach to evaluating soil vapor intrusion is dependent upon site-specific conditions. ... each site presents its own unique set of circumstances.";
- Section 2 — "... no two sites are exactly alike. Site-specific and/or building-specific conditions may warrant modifying the recommendations herein.";

- Section 3.4.2(a) — "The [decision] matrices are generic. As such, it may be appropriate to modify a recommended action to accommodate building-specific conditions...and/or factors provided in Section 3.2 of the guidance...."

Nonetheless, the document has been revised throughout to clarify that the guidance is not a rule, and to eliminate text that might create a contrary impression.

### **A.3 TOPIC: Occupational Safety and Health Administration (OSHA) regulation**

#### Comment A.3.1 (paraphrased, 3 commenters, 9 comments):

The NYSDOH's guidance is attempting to regulate workplace health and safety by requiring investigation and remediation of workplace environments.

##### Response A.3.1:

The guidance is not a regulation, rule or requirement [see Comment A.2.1] and does not require investigation and remediation of workplace environments. As discussed in Comment A.3.2, the guidance provides a reasonable and practical approach for addressing involuntary exposures and health risks associated with soil vapor intrusion. [See also Comments D.5.3 and D.12.8.]

#### Comment A.3.2 (paraphrased, 9 commenters, 22 comments):

Complex legal and policy comments were received regarding the approach taken to address soil vapor intrusion in non-residential buildings, particularly those in occupational settings. These commenters believe OSHA standards are the applicable standards for addressing workplace exposures regardless of the source of the volatile organic compounds (VOCs) found in workplace air. In light of OSHA preemption, the commenters believe that, consistent with the United States Environmental Protection Agency (EPA) and the approach taken by several other states, the NYSDOH guidance should only apply to potential exposures not regulated under OSHA.

##### Response A.3.2:

The document provides guidance on identifying and addressing current and potential involuntary human exposures to contaminated subsurface vapors associated with known or suspected volatile chemical contamination. It does not constitute a rule or regulation.

One of the areas of the EPA's draft guidance that generated much comment from states, industry, and other federal authorities, was the guidance's applicability to workplace settings. The EPA will be addressing this issue in their revised guidance. Contrary to the comment regarding the use of OSHA standards by other states, we have found that the soil vapor intrusion guidance of other states such as Alaska, 2005; California, 2004; Colorado, 2004; New Hampshire, 2005; New Jersey, 2005; and Ohio, 2005, generally defer to OSHA standards only when the chemical(s) in soil vapor are routinely used as part of regular operations in the building. [See also Comments A.3.1, D.5.3 and D.12.8.]

**A.4 TOPIC: NYSDOH's guideline for trichloroethene (TCE) in air**

*Additional comments and responses on the application of the TCE air guideline when evaluating soil vapor intrusion are provided in Part D of this document.*

Comment A.4.1 (paraphrased, 1 commenter, 1 comment):

The NYSDOH should revise the guideline to reflect the most protective assumptions about toxicity and exposure supported by science.

Response A.4.1:

Comments pertaining to the derivation of the guideline for TCE in air are outside the scope of the guidance document. In August 2005, the NYSDOH issued a 300-page draft report entitled *Trichloroethene (TCE) Air Criteria Document*. We convened a Peer Review Panel of national experts selected from nominations solicited from interested parties. The Panel reviewed the report and requested that we consider

- a number of technical comments related to some health endpoints,
- childhood vulnerabilities to a greater extent, and
- adding more detail about the selection of the guideline.

The Peer Review Panel comments along with others that we received and our responses are in the final TCE criteria document [NYSDOH 2006b].

Comment A.4.2 (paraphrased, 1 commenter, 1 comment):

The air guideline value for TCE should be changed to correspond to an excess cancer risk of one-in-one million, which is the target risk level for site remediation established under the new Brownfield Cleanup Program (BCP) statute and the required risk level for the development of soil cleanup objectives under the same statute.

Response A.4.2:

The guideline for TCE in air is not a remediation standard. Rather, it is tool to help make decisions about exposures. Our fact sheet *Trichloroethene (TCE) in Indoor and Outdoor Air* (included in Appendix H of the guidance) describes how the guideline should be used. We emphasize that the guideline is a risk management tool for anyone to use in any situation. The fact sheet states, "The purpose of the guideline is to help guide decisions about the nature of the efforts to reduce TCE exposure. Reasonable and practical actions should be taken to reduce TCE exposure when indoor air levels are above background, even when they are below the guideline of 5 mcg/m<sup>3</sup>. The urgency to take actions increases as indoor air levels increase, especially when they are above the guideline. In all cases, the specific corrective actions to be taken depend on a case-by-case evaluation of the situation. The goal of the recommended actions is to reduce TCE levels in indoor air to as close to background as practical."

The guideline is based on criteria derived using risk assessment methods that are more likely to overestimate than underestimate health risks. This is especially true for exposures that occur for less than a lifetime. The risks estimated at the guideline are based on the assumption that people are continuously exposed to TCE in air all day, every day for as long as a lifetime, which is rarely the case. Most people, if exposed, are more likely to be exposed for only part of the day and part of their lifetime.

At soil vapor intrusion sites, the TCE guideline is used as an action level for shorter term or intermittent exposures. Doing so is warranted given the high level of concern in communities around the state and our responsibility to weigh uncertainties when we seek to protect public health. We cannot emphasize more emphatically that our TCE guideline is not a threshold below which no action is taken. This is exemplified in the

decision matrix for TCE (Soil Vapor/Indoor Air Matrix 1 in the guidance), which provides for response at levels of TCE in indoor air that are less than  $0.25 \text{ mcg/m}^3$ , a level that is in the risk range of one-in-one million for developing cancer over a lifetime of exposure.

Comment A.4.3 (paraphrased, 1 commenter, 1 comment):

We do not feel the scientific evidence justifies the regulation of TCE at the low level of  $5 \text{ mcg/m}^3$ , which is barely detectable by current methods, especially given in the context of other uncertainties associated with the soil vapor intrusion pathway.

Response A.4.3:

The scientific evidence supporting the TCE guideline (it is not a standard or regulation) is addressed and documented in the report *Trichloroethene (TCE) Air Criteria Document* (NYSDOH 2006b), which was recently finalized following peer review by a panel of scientific experts selected from nominations solicited from interested parties. Contrary to the commenters assertion, the level of  $5 \text{ mcg/m}^3$  is detectable by current methods. New York State Law requires laboratories analyzing environmental samples from New York State to have current Environmental Laboratory Approval Program (ELAP) certification for the appropriate analyte/matrix combinations. At present, samples are analyzed by methods that can achieve minimum reporting limits to allow for comparison to background levels (e.g., for halogenated volatile organic chemicals, including TCE, this value is typically  $1 \text{ mcg/m}^3$  or less) and levels presented in the decision matrices (as low as  $0.25 \text{ mcg/m}^3$  for TCE). Thus, laboratories certified by NYS should be capable of detecting TCE in air and measuring it reliably at the appropriate reporting limit.

Comment A.4.4 (paraphrased, 1 commenter, 1 comment):

A guideline of  $5 \text{ mcg/m}^3$  for TCE in air seems quite low, especially since background ranges up to  $4.5 \text{ mcg/m}^3$ . We urge the NYSDOH to assemble background levels of volatile chemicals in urban settings before it proceeds with its  $5 \text{ mcg/m}^3$  TCE guidance.

Response A.4.4:

Several studies have been conducted, both nationally and in the State of New York, to determine indoor and outdoor air background levels of volatile chemicals in a variety of settings (e.g., residential and commercial buildings). The primary databases used when evaluating indoor and outdoor air data are summarized in Section 3.2.4 and Appendix C of the guidance. Both of the EPA studies summarized in Appendix C include data from urban settings. In addition, a study recently published by the Health Effects Institute (HEI), *Relationships of Indoor, Outdoor, and Personal Air (RIOPA). Part I. Collection Methods and Descriptive Analyses. November 2005*, which includes data from Los Angeles, CA, Houston, TX, and Elizabeth, NJ, has been added to the guidance (Section 3.2.4 and Appendix C). Additional studies of background levels of TCE and other chemicals will be considered as they become available.

Overall, these data show that although background indoor air TCE levels have exceeded  $5 \text{ mcg/m}^3$  in a small number of cases, they generally do not exceed  $1 \text{ mcg/m}^3$  with a high proportion (34 to 81%) of sites sampled having no detectable levels of TCE (i.e. TCE levels are  $<0.2 \text{ mcg/m}^3$ ). Similarly, local, site-specific background levels of TCE in outdoor air are generally below  $1 \text{ mcg/m}^3$  but have been higher in a small number of cases. Determination of local, site-specific TCE levels in outdoor air is recommended during investigations at soil vapor intrusion sites. Section 3 of the guidance describes how background levels in indoor and outdoor air should be

considered during data evaluation and the development of recommendations for action in soil vapor intrusion investigations. The TCE guideline of 5 mcg/m<sup>3</sup> is an action level applied within the context of the soil vapor/indoor air matrix and in conjunction with other site-specific information to guide remedial decisions. An overview of how NYSDOH develops air guidelines is provided in Appendix D of the guidance document. A discussion of how background was considered in the development of the TCE guideline can be found in the report *Trichloroethene (TCE) Air Criteria Document* (NYSDOH 2006b), which was recently revised to include more detail about selection of the guideline, as recommended by peer review panel of national experts selected from nominations submitted by interested parties.

Comment A.4.5 (paraphrased, 2 commenters, 2 comments):

We urge the NYSDOH to explain why its guideline for TCE is (5 mcg/m<sup>3</sup>) is 20 times lower than that for PCE (100 mcg/m<sup>3</sup>), which we believe has an approximately equivalent toxicity.

Response A.4.5:

Derivation of the NYSDOH's guidelines for TCE and PCE was a two-step process. The first step was a risk assessment, which provided a range of health-based criteria based on consideration of non-cancer and cancer endpoints. The second step involved derivation of a guideline for use in evaluating exposures, which considered the health-based criteria as well as other factors.

In the first step, criteria based on non-cancer and cancer effects were derived from the available scientific information on TCE and PCE using generally accepted standard risk assessment methods (for PCE, see NYSDOH 1997a; for TCE, see NYSDOH 2006b). Criteria based on non-cancer effects are estimates of air concentrations of TCE or PCE expected to be without any appreciable risk of non-cancer health effects over a lifetime of continuous exposure. The non-cancer criterion (10 mcg/m<sup>3</sup>) for TCE is about 10x lower than the non-cancer criterion (100 mcg/m<sup>3</sup>) for PCE. This difference might reflect actual differences in toxicity, but it could also reflect differences in the nature of the databases available at the time of criteria development. Criteria-based cancer effects are estimates of air concentrations associated with specific levels of excess risk after a lifetime of continuous exposure. Estimates of the concentrations of TCE and PCE in air associated with an excess cancer risk of one-in-one million are similar, about 1.5 mcg/m<sup>3</sup> and 1 mcg/m<sup>3</sup>, respectively.

In the second step of air guideline derivation, other factors are considered such as acceptable levels of risk, analytical techniques, background levels, data gaps, and intended uses of the guidelines to support risk management decisions. This step combines risk assessment and risk management principles. These considerations resulted in a TCE guideline of 5 mcg/m<sup>3</sup> and a PCE guideline of 100 mcg/m<sup>3</sup> (see NYSDOH, 1997a,b,c; 2003, 2005, 2006b). The difference in the values does not solely represent a difference in toxicity. Margins-of-exposure between each guideline and air concentrations associated with non-cancer effects in animals or humans are consistent with recommended procedures. Similarly, the estimated increased human cancer risks associated with lifetime continuous exposure at each guideline are in the risk range generally used by regulatory agencies when making decisions. In both cases, the NYSDOH recommends that steps to reduce exposure should be considered when levels are above background.

Comment A.4.6 (paraphrased, 4 commenters, 3 comments):

It is important that the department has committed to a peer review of its guideline of 5 mcg/m<sup>3</sup> for TCE. Public review and comment on the guideline is needed and will help to ensure that all relevant technical data have been considered. Toward this end, the peer review committee being convened to review the NYSDOH's TCE guideline should be balanced among scientists recommended by government, business, public health and environmental organizations, and affected citizens.

Response A.4.6:

Comment noted. The peer review panel consisted of scientific experts selected from nominations solicited from interested parties.

**A.5 TOPIC: Enforcement, regulating agency and regulations**Comment A.5.1 (paraphrased, 2 commenters, 2 comments):

The guidance appears to be inconsistent with the existing regulatory scheme for remedy selection at an inactive hazardous waste site.

Response A.5.1:

The existing regulatory scheme identifies several criteria that are considered during the remedy selection process at an inactive hazardous waste site. One of these criteria is the protection of human health and the environment, which involves identifying and addressing potential routes of human exposure associated with the environmental contamination. The guidance is consistent with the regulatory scheme in that it provides recommendations on how to investigate and address a specific exposure pathway (soil vapor intrusion) that may exist at a site. While the guidance recommends that the environmental contamination itself (i.e., subsurface vapors) be remediated (either directly or indirectly) and identifies factors that should be considered when selecting a remedy, it does not indicate specific methods that must be used to remediate a site nor does it modify the existing regulatory scheme for remedy selection.

Comment A.5.2 (paraphrased, 1 commenters, 1 comment):

Because the guidance appears to be inconsistent with the existing regulatory scheme for remedy selection under Environmental Conservation Law Article 27, Title 13, as well as 6 NYCRR Part 375, it cannot be justified as an implementation of the inactive hazardous waste disposal site program.

Response A.5.2:

The guidance is not inconsistent with the existing regulatory scheme as it provides general recommendations on how to investigate and address a specific exposure pathway (soil vapor intrusion) that may exist at a site. [See also Comment A.5.1.]

Comment A.5.3 (paraphrased, 1 commenter, 1 comment):

We urge the NYSDOH to revise its soil vapor intrusion guidance to clarify what regulatory program the NYSDOH intends to implement to carry it out. Is the NYSDOH prepared to administer a regulatory program for soil vapor outside of the NYSDEC's current remedial programs, where the NYSDEC refers to the NYSDOH soil vapor issues arising in the BCP, Voluntary Cleanup Program (VCP), State Superfund program, and Environmental Restoration Program (ERP)? Does the NYSDOH intend to regulate soil vapor at projects that

are outside the NYSDEC's remedial programs? Does the NYSDOH intend to regulate soil vapor intrusion at existing structures such as homes, businesses, and schools that are located over areas with existing groundwater contamination? If not, revised guidance might instruct such property owners, who are outside of the NYSDOH's soil vapor regulatory program, on how they might proceed. Perhaps the NYSDOH should work with lenders to encourage financial institutions to require that a soil vapor test be conducted as a prerequisite to closing.

Response A.5.3:

The NYSDOH does not intend to regulate soil vapor intrusion. The guidance is not a regulation, rule or requirement [see Comment A.2.1].

As discussed in the NYSDEC's Program Policy *DER-13: Strategy for Prioritizing Vapor Intrusion Evaluations at Remedial Sites in New York* [NYSDEC 2006], soil vapor intrusion will be evaluated at all completed, current and future sites in the state's environmental remediation programs. Generally, evaluation of the pathway will be included in the program's overall requirements to investigate and remediate environmental contamination at a site. The NYSDOH's guidance complements the NYSDEC's policy by providing recommendations on how to evaluate soil vapor intrusion. The combined goal of the policy and guidance documents is to conduct soil vapor intrusion evaluations as efficiently and effectively as possible at all remedial sites in New York. However, the guidance should be considered anywhere soil vapor intrusion is evaluated in the State of New York, whether the evaluation is undertaken voluntarily by a corporation, a municipality, or private citizen, or whether it is performed under one of the state's environmental remediation programs. Section 1.7 of the guidance has been revised to reflect this recommendation.

Comment A.5.4 (paraphrased, 1 commenter, 6 comments):

Statements in the guidance that pathways "must be investigated" if there is an existing or likely subsurface source of volatile chemicals, or if groundwater or subsurface soil contain volatile chemicals in excess of standard or guidance criteria, and that purport to require sub-slab vapor and indoor air testing for all buildings above or adjacent to known or suspected areas of subsurface contamination, address remedial investigation decisions best left to, and required by law to be left to, the NYSDEC. The "requirement" that samples be tested for a "wide range of volatile chemicals," rather than the volatile chemicals of concern at a particular site, is a sign that the guidance inappropriately seeks to divest NYSDEC of remedial decision-making. The NYSDOH should defer to the NYSDEC on the technical issues involved with sampling to address the soil vapor intrusion to indoor air pathway. It is not appropriate for the NYSDOH to mandate testing where the NYSDEC does not.

Response A.5.4:

The intent of the guidance is to provide recommendations on how to investigate and address exposures related to soil vapor intrusion, not to mandate actions like those described in the comment. To clarify this intent, the document has been revised throughout to reflect that the guidance is not a rule, and text has been eliminated that might create a contrary impression.

The guidance was drafted in consultation with the NYSDEC and should not be interpreted as the NYSDOH operating separately from the NYSDEC. The NYSDEC and NYSDOH work cooperatively as "the State" to develop an investigation and remediation process for sites on an individual basis that is protective of human health and the environment. Toward this end, the State recommends investigation as necessary to ensure sufficient information exists to determine the validity of decisions

made regarding public health. Like the investigation of other environmental media, subsurface vapor investigations will continue to be a cooperative effort between the NYSDEC, NYSDOH, EPA and, in some cases, other applicable parties.

Comment A.5.5 (paraphrased, 1 commenter, 4 comments):

The NYSDOH's jurisdiction extends only to assessing "serious health problems" resulting from a particular site. Investigations of inactive hazardous waste sites should be deferred to the NYSDEC, unless and until a "serious health problem" or "dangerous condition" is demonstrated.

Response A.5.5:

The NYSDEC and NYSDOH work cooperatively as "the State" to develop an investigation and remediation process for sites on an individual basis that is protective of human health and the environment. Toward this end, the State recommends investigation as necessary to ensure sufficient information exists to determine the validity of decisions made regarding public health. Like the investigation of other environmental media, subsurface vapor investigations will continue to be a cooperative effort between the NYSDEC, NYSDOH, EPA and, in some cases, other applicable parties.

Comment A.5.6 (paraphrased, 1 commenter, 1 comment):

The NYSDOH's role should focus on those sites where indoor air quality data indicate that a serious health problem or condition dangerous to life or health results from the site.

Response A.5.6:

The NYSDOH and NYSDEC work cooperatively in the investigation and remediation of sites in New York State. During this process, the NYSDOH is responsible for making sure both current and potential human exposures associated with the environmental contamination (e.g., contaminated soil, groundwater, soil vapor, sediments, etc.) are identified and addressed. Placing the focus of a soil vapor intrusion evaluation on indoor air quality data alone, as suggested in the comment, does not allow for an evaluation of the potential for future exposures.

Comment A.5.7 (paraphrased, 1 commenter, 1 comment):

Section 4: Soil Vapor Intrusion Mitigation — The guidance indicates that significant testing, design, operation and maintenance as well as public participation are all required, yet does not address which agency (NYSDEC or NYSDOH) will manage and run the program. How is all of the reporting supposed to be carried out in accordance with the guidance and who/what agency will give appropriate signoffs where mitigation is not required or when it is completed?

Response A.5.7:

The intent of Sections 4 and 5 of the guidance is to provide recommendations on how to address exposures related to soil vapor intrusion and how to keep the community informed, not to mandate actions as those described in the comment. To clarify this intent, the document has been revised to reflect that the guidance is not a rule, and text has been eliminated that might create a contrary impression.

Generally, the process for implementing and managing mitigation actions is analogous to that employed for other interim remedial measures. The extent of the testing,

outreach, operation and maintenance, etc. will vary and should be determined on a site-specific basis. The proposed activities are presented in applicable site-specific work plans, such as an interim remedial measure work plan, a site management plan (formerly referred to as an operation, maintenance and monitoring plan), or a citizen participation plan. These plans are submitted to the NYSDEC and the NYSDOH, who work cooperatively in reviewing and approving such plans. Activities are subsequently carried out in accordance with approved work plans. Completed actions are usually summarized in reports. Once again, the NYSDEC and NYSDOH work cooperatively in reviewing and approving such reports. In general, final sign-offs are issued by the regulating agency, the NYSDEC, in consultation with the NYSDOH.

Comment A.5.8:

Does the state expect that the City of New York will enforce soil vapor guidance at all sites within its borders? The City presently does not regulate sites outside environmental review or designation processes, and much of this review is for pre-development activities.

Response A.5.8:

The NYSDEC and NYSDOH do not expect that local government will "enforce" this guidance. The Agencies intend to use the guidance in the evaluation of vapor intrusion at every site in which they are involved, and recommend that the guidance be considered anywhere soil vapor intrusion is evaluated in the State of New York.

Comment A.5.9 (paraphrased, 1 commenter, 1 comment):

Given the complex nature and potential impacts represented by soil vapor intrusion, we believe that it is important for the Agencies to promulgate regulations for the monitoring, measurement and mitigation of contaminated subsurface vapors and to discontinue their past and current practice of managing vapor intrusion in the State of New York through guidance documents and policies.

Response A.5.9:

The evaluation of the vapor intrusion pathway is an emerging science. The NYSDEC's Program Policy *DER-13: Strategy for Prioritizing Vapor Intrusion Evaluations at Remedial Sites in New York* [NYSDEC 2006] and the NYSDOH's guidance provide the necessary framework for evaluating soil vapor intrusion at remedial sites across New York. At this time, the Agencies do not intend to promulgate regulations for the monitoring, measurement and mitigation of contaminated soil vapor but will, as appropriate, make any soil vapor intrusion mitigation or monitoring plans part of the remediation plans for a site.

## **A.6 TOPIC: Guidance with respect to the New York State Brownfield Cleanup Program (BCP)**

Comment A.6.1 (paraphrased, 1 commenter, 2 comments):

Because Section 2.1 of the guidance states that investigation is required when the soil cleanup standards are exceeded or when there is an existing subsurface source or likely subsurface source of volatile chemicals, regardless of whether NYSDEC soil cleanup standards are exceeded, the guidance undercuts the purpose and intent of the Brownfield Cleanup Act.

Response A.6.1:

The purpose and intent of the "Brownfield Cleanup Program" is to encourage cleanup and redevelopment of brownfield sites using remedies that are fully protective of public health and the environment. The guidance provides an approach that will accomplish these goals at brownfields. Specifically, the guidance will help ensure that responsible parties seeking to investigate and remediate brownfield soil contamination will consider important site-specific factors such as the toxic potential of the contaminant(s) present, the extent of contamination, preferential pathways, subsurface hydrology, soil properties, existing structures, and anticipated future use.

Comment A.6.2 (paraphrased, 1 commenter, 1 comment):

The guidance states that action should be taken to reduce exposures when indoor air levels are "above background," even if those levels are below current guidance values (p. 33). This position is contrary to the NYSDOH's approach to drinking water quality, and effectively negates the approach taken by other air quality guidance documents published by the NYSDEC, including DAR-1.

The guidance states that "the goal of the recommended [corrective] actions is to reduce chemical levels in indoor air to as close to background as possible." The objective of all remedial programs was recently articulated by the Legislature in the Brownfield Cleanup Act (BCA) as the attainment of levels of contaminants protective of human health. The fact that this is not the objective of the guidance indicates that the NYSDOH is overreaching. We recommend that the objective of the guidance be restated as the attainment of levels of contaminants in indoor air that are protective of human health given the use to which the building is put.

Response A.6.2:

The guidance is not inconsistent with our approach to other media (such as contaminated groundwater or soil), where the reduction of exposure is a primary objective. Therefore, the guidance has not been revised as suggested.

The reference that reasonable and practical action (not necessarily mitigation) should be taken to reduce exposure to chemicals when indoor air levels are above background (even when they are below the guideline) is intended to address exposures which may be due to indoor and/or outdoor sources rather than soil vapor intrusion. The guidance is not prescriptive on what actions need to be taken or by whom. In general, if indoor exposures represent a concern due to indoor sources, then the State will provide guidance to the property owner and/or tenant on ways to reduce their exposure. If indoor exposures represent a concern due to outdoor sources, then the NYSDEC will decide who is responsible for further investigation and any necessary remediation. Depending upon the outdoor source, this responsibility may or may not fall upon the party conducting the soil vapor intrusion investigation. Section 3 of the guidance has been revised to clarify this point.

[See also Comment D.10.23 (applicability of DAR-1 air guidelines).]

Comment A.6.3 (paraphrased, 1 commenter, 1 comment):

How will the mitigation requirements (testing, design, operation and maintenance, and public participation) set forth in this guidance be coordinated with the NYSDEC Brownfield Cleanup Program?

Response A.6.3:

Generally, the process for implementing and managing mitigation actions within the BCP is analogous to that employed for other interim remedial measures. The extent of the testing, outreach, operation and maintenance, etc. will vary and should be determined on a site-specific basis. Activities appropriate for the site should be included in site-specific work plans and reports submitted to the NYSDEC and NYSDOH as part of the BCP. Such plans and reports may pertain to interim remedial measures, operations, maintenance and monitoring, and citizen participation. [See also Comment A.5.7.]

Comment A.6.4 (paraphrased, 1 commenter, 1 comment):

The passage of the New York State (NYS) Brownfields Law was a major step towards addressing the uncertainty associated with the cleanup and redevelopment of brownfield sites. We are concerned that the guidance will have the unintended consequence of impeding brownfields redevelopment due to its ambiguity and lack of clarity, particularly at sites where the profit margins are narrow. If the guidance can be tightened up so that brownfield stakeholders are provided clear requirements that can be carried out efficiently, the NYSDOH has an opportunity to protect the public from vapor intrusion and promote the safe redevelopment of brownfield sites.

Response A.6.4:

The intent of the guidance is to provide recommendations on how to investigate and address exposures related to soil vapor intrusion. As discussed in Section 1.8 of the guidance, the investigation, evaluation, mitigation and remediation of soil vapor and soil vapor intrusion are evolving disciplines. The guidance provides as detailed recommendations as possible given the current state of knowledge and our experience. To make the guidance more prescriptive would not allow for the flexibility needed in investigating and addressing this complex exposure pathway and may not be appropriate for all sites. The guidance has not been revised in response to this comment. However, if the results of future investigations indicate that recommendations currently presented in the guidance (or the bases for those recommendations) are inappropriate or are unnecessarily vague, then the guidance will be revised or amended accordingly.

Comment A.6.5:

In the context of the NYS Brownfield Cleanup Program, we have some concerns about how the issue of off-site vapor migration might be dealt with when the BCP applicant is a volunteer. On-site vapor intrusion can be dealt with easily with engineering controls. However, in the absence of some threshold values that link soil vapor values with off-site levels of vapor in buildings, the State of New York and the regulated community may be confronting a challenge of immense proportions.

Response A.6.5:

Data collected to date from the investigation of sites in New York State do not support the use of soil vapor results to predict or model indoor air concentrations reliably. However, soil vapor results along with the results of sampling other environmental media and the conceptual site model can be used to indicate whether soil vapor may be migrating off-site and representing an off-site exposure concern. In accordance with the BCP, the Volunteer should include this potential route of exposure in the Qualitative Off-site Public Health Exposure Assessment for the site. As with other environmental media, the NYSDEC (not the Volunteer), in consultation with the

NYSDOH, would be responsible for addressing off-site contamination. This includes identifying any potential responsible parties and enrolling them into an appropriate remedial program. [See also Comment A.11.1.]

Comment A.6.6 (paraphrased, 1 commenter, 1 comment):

In brownfield redevelopment situations, the uncertainty and risk associated with vapor intrusion studies may detract from such redevelopment. While the likelihood of vapor intrusion can be investigated during the design, the guidance states that a final assessment cannot be performed until at least 30 days after site redevelopment is complete, presuming this occurs during the heating season. The site facility could only be re-occupied if monitoring results are favorable. If results are not favorable, a plan may need to be implemented for additional mitigation measures, which are not assured to work. We are concerned that uncertainty about achieving acceptable soil vapor levels may discourage parties from entering the BCP.

Response A.6.6:

The comment refers to the recommendation that after a sub-slab depressurization (SSD) system is installed, its effectiveness should be confirmed. As described in Section 4.3.1 of the guidance, chemical testing is recommended no sooner than 30 days after the system is installed. If the system is installed outside of the heating season or at the end of a season, post-mitigation sampling may be postponed. In the absence of chemical testing, physical testing (e.g., demonstrating the system is depressurizing the entire slab) can be used to demonstrate the effectiveness of the system at any time. The use of SSD systems to mitigate the potential for soil vapor intrusion is a proven technology and the likelihood of failure is small. Therefore, the recommendation for post-mitigation sampling is not expected to preclude the occupancy of an on-site building that is being mitigated or the redevelopment of a brownfield site.

Comment A.6.7 (paraphrased, 3 commenters, 5 comments):

The requirements of the vapor intrusion guidance will discourage parties to voluntarily clean-up brownfield sites. Reluctance may be due to uncertainty in the level and the length of remedial activities that may be required or an inability to get financing to remediate and develop the site. In addition, there may be lingering concerns about liability issues, such as in locations of area-wide groundwater contamination.

Response A.6.7:

The guidance allows for flexibility in site redevelopment and should not preclude satisfactory redevelopment of sites. In many cases, mitigation systems have been installed on new or existing buildings as preventative measures to address concerns about soil vapor intrusion and radon. This may be prudent in areas of wide-spread groundwater contamination. While areas of site-wide groundwater contamination of an unknown source may present redevelopment difficulties, the State will be responsible for addressing or identifying the responsible party to address sources of contaminants not attributable to the site itself. To the extent that site data and site conditions demonstrate that soil vapor intrusion is not occurring and that the potential for soil vapor intrusion to occur is not likely, the soil vapor intrusion investigation would be considered complete. If a soil vapor intrusion investigation is needed but it is not the responsibility of the participant in a specific environmental remediation program, then the NYSDEC and NYSDOH will make sure appropriate actions are taken to complete the investigation and remediation, as well as to address exposures. This

would include identifying any additional responsible parties and enrolling them into an appropriate remedial program.

**A.7 TOPIC: Guidance with respect to the Resource Conservation and Recovery Act (RCRA) Program**

Comment A.7.1 (1 commenter, 1 comment):

NYSDOH appears to be applying these residential air guidelines to all sites without regard to site operations or other regulatory programs governing human exposures. The *Current Human Exposures Under Control* environmental indicator (EI) under the Government Performance Results Act (GPRA) is an interim milestone developed by and for the Environmental Protection Agency, providing a measure of progress toward controlling human exposures to contamination at facilities subject to Resource Conservation and Recovery Act (RCRA) Corrective Action. For operating RCRA facilities subject to the GPRA, the exposure criteria used to meet the *Current Human Exposures Under Control* EI should therefore be consistent with current operations and exposure scenarios rather than a potential future land use human exposure scenario.

Response A.7.1:

All sites and projects must be evaluated based upon the individual conditions at each one. The State understands that EIs are performed periodically at RCRA regulated facilities. These periodic EIs document that human exposures are under control at a particular point in time. However, potential future exposures must be taken into account before a RCRA regulated facility can be dismissed from the RCRA program.

**A.8 TOPIC: Guidance with respect to other vapor intrusion guidance or policies**

Comment A.8.1 (paraphrased, 13 commenters, 40 comments):

Commenters noted that the approach to evaluating soil vapor intrusion in the guidance differs from those developed by other state and federal agencies. Numerous comments were received encouraging the NYSDOH to adopt an approach more analogous to those of others due to the scientific uncertainty in this developing field. They believe the approach outlined in the guidance does not allow for a focused vapor intrusion study and recommended the following key considerations be incorporated into the guidance:

- an iterative process, i.e., start with available data and collect only additional data to meet the needs of making informed decisions;
- development of an accurate site conceptual model that is representative of site conditions to ensure proper use of the data when evaluating the potential vapor to indoor air pathway under both generic and site-specific evaluations;
- flexibility to enable the use of professional judgement given site-specific circumstances;
- use of distance criteria (such as the "100-foot criterion" presented in the NYSDEC's November 2004 Draft Program Policy) to eliminate sites or buildings from vapor intrusion investigation;
- a site-specific evaluation using modeling, soil vapor sampling, indoor air sampling or mitigation at any point in the process;
- use of default attenuation factors as a first tier to allow screening of either soil vapor or sub-slab vapor data and as a tool to determine whether repeated monitoring of indoor air is necessary;

- a tiered approach that allows for the collection and use of both generic and site-specific information/data and comparisons to risk-based screening levels prior to sampling sub-slab vapor and indoor air;
- use of multiple lines of evidence, including modeling from the subsurface, to determine if chemicals detected in indoor air are due to vapor intrusion or other potential sources;
- near-gas sampling or a weight-of-evidence approach (including building construction details, depth to source) to preclude sub-slab vapor and indoor air sampling; and
- use of screening levels, including use-specific (i.e., residential and commercial) screening levels, in environmental media to identify sites where a detailed investigation of vapor intrusion is not required.

Furthermore, commenters recommended that (at a minimum) the state should accept and adopt the soil vapor screening levels and default attenuation factors presented in the EPA's guidance (EPA 2002) (including any subsequent revisions to this document). They also requested that the NYSDOH explain why data collected from the IBM Endicott site -- data which support the conclusion that these attenuation factors are conservative -- have not been incorporated into the guidance for the development of realistic attenuation factors.

Response A.8.1:

The guidance is intended to provide general approaches and strategies to collect appropriate and relevant data with respect to evaluating the soil vapor intrusion pathway. The State recognizes that each site is unique and that the approach to evaluating soil vapor intrusion is dependent upon site-specific characteristics. As such, the guidance outlines a phased iterative approach to investigation in which existing environmental site data are evaluated to define the nature and scope of subsequent investigation and/or remediation. The guidance also allows for consideration of measures to mitigate exposures or to remediate subsurface vapor contamination at any time during the investigation and remediation of a site (see also Comment A.16.1). The phased iterative nature of the investigation is similar to investigation of other environmental media (e.g., soil, groundwater, etc.) and analytical data collected as part of this effort are intended to be incorporated into a conceptual site model. As discussed in Part B.7 (TOPIC: Conceptual site model), Section 1.6 of the guidance has been revised to describe the relationship between the general approach to evaluating soil vapor intrusion and a conceptual site model.

As discussed in Section 3.0, the results of individual soil vapor, sub-slab vapor, indoor air and outdoor air samples are not reviewed in isolation. Rather, data are evaluated using a multiple-lines-of-evidence approach in which many factors, such as the nature and extent of contamination in all media, background sources of volatile chemicals in indoor air, sources of volatile chemicals, factors that affect vapor migration and intrusion, current and future site use, applicable standards, criteria and guidance values are considered. This approach is used to identify the need for additional investigation and to select appropriate actions to address exposures related to soil vapor intrusion.

With regard to generic distance criteria, soil vapor intrusion data collected to date do not support the use of such criteria to screen-out sites for further evaluation. As such, the NYSDEC has decided to revise its draft policy (referenced in the comment; NYSDEC 2004) and not apply a generic threshold criterion based on distance from a source of contamination to an occupied structure. [See also Comments A.12.5, C.2.2 and D.10.3.]

With regard to "screening" criteria, soil vapor intrusion data collected to date do not support the development of such criteria (based on soil, groundwater or near-slab vapor data) or the generic application of the EPA's criteria. For example, the State acknowledges that in many instances near-slab vapor concentrations are similar to sub-slab vapor concentrations. However, a sufficient number of cases exist where sub-slab concentrations are elevated with respect to near-slab concentrations, sometimes by an order of magnitude or more. This may be due to differences in factors such as soil moisture content and pressure gradient. Therefore, use of near-slab vapor data to predict sub-slab vapor or indoor air concentrations is not considered protective of public health. The State has no plans at this time to develop soil, soil vapor or groundwater screening criteria for determining the need for investigation of the soil vapor intrusion pathway. [See also Comments D.5.5 and D.10.3.]

With regard to attenuation factors, although an extensive data set from the IBM Endicott site has been collected, data from other sites have not indicated that a single attenuation factor can be universally applied at a site or between sites at this time. Our data indicate that soil vapor and sub-slab soil vapor concentrations can be highly variable and cannot accurately and reliably predict or model expected indoor air concentrations. Given these uncertainties, the application of a generic attenuation factor is not considered to be protective of public health. [See also Comments D.10.12, D.12.9 and E.2.12.]

Overall, as discussed in Section 1.8 of the guidance, the investigation, evaluation, mitigation and remediation of soil vapor and soil vapor intrusion are evolving disciplines. The guidance provides as detailed recommendations as possible given the current state of our knowledge and experience. To make the guidance more prescriptive precludes the flexibility needed in investigating and addressing this complex exposure pathway and may not be appropriate for all sites. The State believes that the guidance provides a reasonable and practical approach to evaluating soil vapor intrusion that is

- analogous to the approach taken when investigating contamination in other environmental media (e.g., groundwater, soil, etc.) and addressing corresponding exposure concerns, and
- supported by data collected during soil vapor intrusion investigations throughout New York State to date.

[See also Comments A.9.8, A.10.3 and D.15.7.]

Comment A.8.2 (paraphrased, 1 commenter, 2 comments):

The guidance seems to overstep the NYSDOH's jurisdictional bounds, and potentially conflicts with the NYSDEC's proposed soil vapor intrusion guidance, by directing whether, when and where soil vapor samples should be taken. The development of guidance on the method of sampling environmental media, the number of samples taken, the frequency of monitoring, and decisions on remedial measures for vapor intrusion pathways is within NYSDEC's purview, not the NYSDOH's.

Response A.8.2:

The NYSDOH, in cooperation with NYSDEC, is responsible for assessing potential human exposure pathways at contaminated sites. The guidance provides recommendations on how to investigate and address a specific exposure pathway (soil vapor intrusion) that may exist at a site. As discussed in the NYSDEC's Program Policy *DER-13: Strategy for Prioritizing Vapor Intrusion Evaluations at Remedial Sites in New York* [NYSDEC 2006], this pathway will be evaluated at all completed, current and

future sites in New York State. The NYSDOH's guidance complements the NYSDEC's policy by providing recommendations on how to evaluate soil vapor intrusion. The guidance was drafted in consultation with the NYSDEC and should not be interpreted as the NYSDOH operating separately from the NYSDEC. The combined goal of the policy and guidance documents is to conduct soil vapor intrusion evaluations as efficiently and effectively as possible at all remedial sites in New York.

Comment A.8.3 (paraphrased, 1 commenter, 1 comment):

We are concerned that the guidance presents an "all or nothing" approach to testing for soil vapor intrusion. The guidance fails to present the type of tiered approach recently articulated by the NYSDEC in its Draft Soil Vapor Intrusion Guidance document entitled "Evaluating the Potential for Vapor Intrusion at Past, Current and Future Sites." The guidance indicates that full protocol for soil vapor testing is "necessary" at any site where there is even a possibility of soil vapor intrusion.

Response A.8.3:

As a point of clarification, the document referenced in the comment is the NYSDEC's *Draft Program Policy Evaluating the Potential for Vapor Intrusion at Past, Current, and Future Sites* [November 22, 2004, draft]. This policy does not present a tiered approach to screen sites out of investigation, as suggested in the comment. Rather, the policy states that the soil vapor intrusion pathway will be evaluated at all completed, current and future sites in New York State. It also provides a strategy for prioritizing the evaluation of the soil vapor intrusion pathway at sites where remedial decisions have already been made (i.e., past sites). The strategy was developed due to the large number of past sites and to the lack of resources to evaluate soil vapor intrusion at all of the past sites simultaneously. The NYSDOH's guidance complements the NYSDEC's policy by providing recommendations on how to evaluate soil vapor intrusion. The combined goal of the policy and guidance documents is to conduct soil vapor intrusion evaluations as efficiently and effectively as possible at all remedial sites in New York.

The State believes that the guidance provides a reasonable and practical approach to evaluating soil vapor intrusion that is analogous to the approach taken when investigating contamination in other environmental media (e.g., groundwater, soil, etc.) and addressing corresponding exposure concerns. Therefore, the guidance has not been revised in response to the comment.

Comment A.8.4 (paraphrased, 2 commenters, 2 comments):

Petroleum hydrocarbon sites are recognized as being of lower threat than chlorinated solvent sites in the NYSDEC's guidance "Evaluating the Potential for Vapor Intrusion at Past, Current, and Future Sites." However, no distinction is made in the NYSDOH's guidance.

Response A.8.4:

The referenced document, the NYSDEC's *Draft Program Policy Evaluating the Potential for Vapor Intrusion at Past, Current, and Future Sites* [November 22, 2004, draft], provides a strategy for prioritizing the evaluation of the soil vapor intrusion pathway at sites where remedial decisions have already been made (i.e., past sites). The strategy was developed due to the large number of past sites and to the lack of resources to evaluate soil vapor intrusion at all of the past sites simultaneously. Therefore, for the purposes of prioritization, past sites with petroleum hydrocarbon contamination were considered to be a lower concern for soil vapor intrusion than past sites with chlorinated solvent contamination. The NYSDOH's guidance is intended to provide an

approach for investigating and addressing the potential for soil vapor intrusion at sites (past, present and future) with volatile chemical contamination, regardless of the nature of the contamination.

### **A.9 TOPIC: Approach to evaluating soil vapor intrusion – New York State's general approach**

#### Comment A.9.1 (paraphrased, 1 commenter, 1 comment):

The goal of New York State's vapor intrusion policy should be to reduce the risk to human health to an excess cancer risk of one-in-one million and a hazard index of one for non-cancer end points.

#### Response A.9.1:

As set forth in the guidance, the overall goal of recommended actions is to reduce contaminant levels in indoor air to as close to background as practical. [See also Comment A.4.2.]

#### Comment A.9.2 (paraphrased, 1 commenter, 3 comments):

The economic benefits in terms of incremental reduction in health risk often will not justify the cost of the sampling and/or mitigation that the guidance would call for. The guidance encourages considerable resources to be devoted to reducing risk levels that will have little public health benefit. The guidance should not be constructed in a manner that identifies through exhaustive investigation all situations in which the vapor intrusion pathway could — under any hypothetical circumstances — present risks in excess of stringent criteria. Rather, it should embody a philosophical approach that pursues situations where vapor intrusion is plausibly a significant threat.

#### Response A.9.2:

In environmental remediation, decisions rarely come down to a simple cost-benefit analysis. Cost is one of many factors that weigh in the determination of the best path forward for any given site. One of the goals of New York State's environmental remediation programs is to minimize, to the extent practicable, human exposure to site-related contamination through all potential exposure pathways, including the soil vapor intrusion pathway. The guidance, as presented, is consistent with that goal.

#### Comment A.9.3 (2 commenters, 1 comment):

In the absence of a preliminary risk-based screening step, all results including soil vapor and subslab are compared to background indoor or outdoor air concentrations. Without the inclusion of a screening step, NYSDOH should explain how vapor intrusion evaluations will be focused to avoid background issues and inconclusive sampling results.

#### Response A.9.3:

The State acknowledges that an understanding of background sources is a crucial part of the data evaluation process. Section 2.11 of the guidance recommends ways to identify alternate sources of volatile chemicals in the indoor air and, where appropriate, to minimize potential sampling interferences. As discussed in Section 3, a multiple-lines-of-evidence approach is recommended to identify sources of volatile chemicals to the indoor air and to select appropriate steps to address exposures. With respect to soil vapor data, a "whole picture" approach is recommended to identify trends and spatial variations in the data (Section 3.3.1). Background issues are

addressed by looking at the data as a whole and with consideration of the conceptual site model and factors discussed in Section 3.

Comment A.9.4:

Since the guidance does not allow no further action based on modeling and does not have any soil or groundwater criteria for screening that could lead to no further action, soil vapor, indoor air, outdoor air and sub-slab sampling will have to be collected at a minimum. Existing environmental data (groundwater and soil) are only used to select soil vapor, indoor air and sub-slab sampling locations. However, the guidance is very subjective on how this data is used. Integration of the Data Quality Objectives (DQO) process to develop sampling plans would alleviate concerns about the guidance's subjective treatment of data. There are no options for saving costs through screening. In some instances, perhaps skipping sampling and going straight to mitigation could be the most economical option.

Response A.9.4:

Comment noted.

Comment A.9.5 (paraphrased, 1 commenter, 1 comment):

The final guidance document must be clear in that, at most, its provisions provide a default approach that is acceptable to the NYSDOH, and that the NYSDOH may review and accept alternative approaches that are consistent with statutory and regulatory requirements.

Response A.9.5:

The intent of the guidance is to provide recommendations on how to investigate and address exposures related to soil vapor intrusion. As discussed in Section 1.8 of the guidance, the investigation, evaluation, mitigation and remediation of soil vapor and soil vapor intrusion are evolving disciplines. The guidance provides as detailed recommendations as possible given the current state of knowledge and our experience to date. Alternative approaches to evaluating soil vapor intrusion, may be proposed and described thoroughly in applicable site-specific work plans submitted for review by the State (e.g., investigation plans, citizen participation plans, interim remedial measure plans, etc.). The NYSDEC and NYSDOH work cooperatively in reviewing and approving such plans. To the extent that other approaches meet the objectives discussed in Section 1.5 and throughout the guidance, they will be considered.

Comment A.9.6 (paraphrased, 1 commenter, 1 comment):

Many soil vapor intrusion studies will be done in the context of remedial investigation activities at contaminated sites. There will be a wealth of soil, groundwater, and often, soil vapor data available concerning the nature and extent of contamination. Potentially Responsible Parties (PRPs) should not be required to implement the guidance's rigid protocol which appears to be designed to provide a scientific site-wide model of the areal and vertical extent of soil vapor as it changes over time, when so much data is already available.

Response A.9.6:

Acknowledged. As discussed in Section 1.5, "...the approach to evaluating soil vapor intrusion is dependent upon site-specific conditions. A thorough understanding of the site...is used to develop an investigation plan. Existing information is reviewed to determine what data are available and what additional data should be collected, as well as to guide the investigation." If existing site data are sufficient to characterize

the nature and extent of subsurface vapor contamination, to evaluate current and potential exposures to contaminated subsurface vapors, and to determine what actions, if any, are needed to address exposures and to remediate contaminated subsurface vapors, then additional data are not necessary.

Comment A.9.7 (paraphrased, 2 commenters, 2 comments):

The guidance creates a substantial (and arguably insurmountable) burden of proof in relation to showing that there is no chance of future vapor migration and that no further action is needed. The circumstances that define these scenarios are so limited that they are seemingly unrealistic.

Response A.9.7:

The State believes that the guidance provides a reasonable and practical approach to evaluating soil vapor intrusion that is analogous to the approach taken when investigating contamination in other environmental media (e.g., groundwater, soil, etc.) and addressing corresponding exposure concerns. The State does not believe that the approach recommended in the guidance is overly burdensome or unrealistic. "No further action" decisions have been made at sites. Additionally, the delineation of subsurface contamination in terms of identifying buildings where no further action to address exposures related to soil vapor intrusion has been accomplished. [See also Part D.15 (TOPIC: Site close-out — no further action or completion determinations).]

Comment A.9.8 (paraphrased, 1 commenter, 1 comment):

The procedure and requirements outlined in this document differ drastically from all other existing or proposed Federal or State vapor intrusion policy around the country. The primary question that New York State needs to ask itself is whether it wants to have a policy that is inconsistent with the rest of the country.

Response A.9.8:

While there are differences between our guidance and the guidance provided by others, we believe that our guidance provides a reasonable and practical approach to evaluating soil vapor intrusion that is

- analogous to the approach taken when investigating contamination in other environmental media (e.g., groundwater, soil, etc.) and addressing corresponding exposure concerns, and
- supported by data collected during soil vapor intrusion investigations throughout New York State to date.

[See also Comment A.8.1.]

Comment A.9.9:

There needs to be a more common sense approach that addresses the urban sites both from the perspective of investigation requirements and remedial measures. One possibility is to identify the circumstance, based on site investigation results, that a basic measure, e.g., an engineered barrier, could be applied without the need for extensive vapor investigation.

Response A.9.9:

Measures to mitigate exposures or to remediate subsurface vapor contamination can be considered and agreed upon at any time during the investigation and remediation

of a site. Implementation of such measures may eliminate or limit the need for soil vapor intrusion investigations. These determinations are made on a site-specific basis. [See also Part A.16 (TOPIC: Presumptive remedies).]

Comment A.9.10:

The guidance leaves significant flexibility in terms of evaluation of data and determination of vapor intrusion. Although the flexibility is appropriate to handle the wide variations of site conditions across the state, it also leaves open a significant potential for inconsistent application of the guidance from one region to the next. How does the State plan to manage potential consistency issues? Will it make available a database of decisions made by state agencies across the state? Will decisions made for sites under State responsibility be consistent with sites under private responsibility?

Response A.9.10:

One of the reasons why the guidance was prepared was to promote consistency in addressing the issue of soil vapor intrusion. While approaches for meeting the objectives discussed in the guidance may vary, the objectives themselves remain consistent from site to site. The State will use the guidance in the evaluation of vapor intrusion at every site that it is involved in and recommends that the guidance be considered anywhere soil vapor intrusion is evaluated in the State of New York — whether the evaluation is being undertaken voluntarily by a corporation, a municipality, or private citizen, or under one of the state's environmental remediation programs.

Training sessions on the State's approach to evaluating soil vapor intrusion were conducted throughout the state to supplement the guidance. Audiences included state, local and regional DOH and NYSDEC staff, the regulated community, and the general public. Completion of training, with updated training sessions as needed, is intended to provide a uniform level of knowledge regarding soil vapor intrusion.

In addition to these efforts, consistency issues will be handled in a manner similar to that used when investigating other environmental media. For sites in one of the State's environmental remediation programs, consistency is addressed through the submittal, review and approval of work plans and reports. In accordance with these programs, decisions made and actions taken are intended to be protective of public health and the environment. A database of soil vapor intrusion decisions is not planned at this time.

Comment A.9.11 (paraphrased, 3 commenters, 3 comments):

The guidance would be more helpful if it was less vague and not as reliant on interpretation. The NYSDOH must ensure that flexibility does not require unnecessary sampling and over analysis and that the guidance provides a clearer process for conducting analyses and interpretation of the results.

Response A.9.11:

The intent of the guidance is to provide recommendations on how to investigate and address exposures related to soil vapor intrusion. As discussed in Section 1.8 of the guidance, the investigation, evaluation, mitigation and remediation of soil vapor and soil vapor intrusion are evolving disciplines. The guidance provides as detailed recommendations as possible given the current state of knowledge and our experience to date. To make the guidance more prescriptive would not allow for the flexibility needed in investigating and addressing this complex exposure pathway and may not

be appropriate for all sites. The appropriate amount of sampling will vary and is therefore determined on a site-specific basis.

The guidance has not been revised in response to this comment. However, if the results of future investigations indicate that recommendations currently presented in the guidance (or the bases for those recommendations) are inappropriate or are unnecessarily vague, then the guidance will be revised or amended accordingly.

#### **A.10 TOPIC: Approach to evaluating soil vapor intrusion – Petroleum hydrocarbon sites**

Comment A.10.1 (paraphrased, 1 commenter, 1 comment):

The agency may want to consider adopting separate vapor intrusion guidance relating to petroleum hydrocarbons.

Response A.10.1:

The guidance is intended to provide an approach for investigating and addressing the potential for soil vapor intrusion at sites with volatile chemical contamination, regardless of the nature of the contamination. If investigations of sites indicate a particular type of site warrants special considerations (e.g., petroleum hydrocarbon sites, manufactured gas plant sites, dry cleaner sites, etc.), then these considerations will be included in revisions or amendments to the guidance.

Comment A.10.2 (paraphrased, 3 commenters, 7 comments):

Several commenters recommended special considerations for petroleum hydrocarbon sites. These considerations are summarized as follows:

- To reflect the lower potential threat associated with petroleum hydrocarbon sites accurately, the guidance should require less extensive vapor intrusion investigations.
- Methods for evaluating the significance of biodegradation through a multiple-lines-of-evidence type of approach should be included to avoid the likelihood of sampling indoor air and sub-slab soil vapor.
- For biodegradable compounds, conservative default dilution or degradation factors, as well as a subsurface vapor to indoor air attenuation factors, could be adopted.
- Screening levels for certain petroleum hydrocarbons should be considered. There is likely to be many, if not a majority of cases for petroleum VOCs (in particular, dissolved phase sources), where soil-gas data can be used to demonstrate an incomplete pathway (i.e., soil-gas concentrations fall below levels of detection, outdoor air, or background concentrations).
- The agency should consider a tiered or phased approach based on the analysis of groundwater and soil vapor with comparison to risk-based screening levels.

Response A.10.2:

To date, the assessment of petroleum hydrocarbon sites has been based on soil vapor sampling results, indoor air results, model predictions, or some combination thereof. The information currently available does not support the use of soil vapor or groundwater screening values or of default factors for attenuation, dilution or degradation to presumptively rule out sub-slab vapor or indoor air sampling. Specifically, field data demonstrating the following are scarce:

- the relationship between the results of sampling outside of buildings (soil vapor) and within buildings (sub-slab vapor and indoor air),
- the relationship between sub-slab vapor and indoor air concentrations, and
- the effect of biodegradation on sub-slab vapor concentrations.

If field data across the state demonstrate the validity of the considerations presented by the commenters, the State will update or amend the guidance accordingly.

[See also Comments A.8.1 and B.4.1.]

Comment A.10.3 (paraphrased, 2 commenters, 2 comments):

Fitting petroleum compounds into the existing matrices would be difficult and applying highly compound-specific matrices to the broad list of petroleum compounds may be too confusing.

Response A.10.3:

Comment noted.

**A.11 TOPIC: Party responsible for investigating and taking action(s) to address exposures**

Comment A.11.1 (paraphrased, 1 commenter, 1 comment):

The guidance does not clearly address potential issues that often arise at Brownfields sites. In particular, who should investigate and take appropriate measures for the off-site sources of airborne contaminants? What is the building owner supposed to do if elevated levels are found in the building that are attributable to off-site sources, even if the conclusion is that it is an ambient condition? Also, should a BCP volunteer be responsible for off-site effects of contamination emanating from his property in the vadose zone? Under the BCP the volunteer only needs to deal with on-site contamination and qualitatively assess off-site impacts. Will the participant alert off-site building owners that a soil vapor intrusion threat exists and trigger expenditures on their part? Will more financial responsibility be required or expected of the volunteer?

Response A.11.1:

Should a BCP Volunteer document elevated volatile chemical levels that are determined, by the NYSDEC and NYSDOH, to originate from an off-site source and represent a potential significant threat, the NYSDEC will notify the responsible party of the findings and enroll them into one of NYSDEC's remedial programs. Should the off-site source property owner refuse to participate or if a responsible party does not exist, the NYSDEC, in consultation with the NYSDOH, will be responsible for taking appropriate actions to address exposures in the Volunteer's and other buildings and may undertake cost recovery from the off-site property owner.

Typically, at a minimum, a Volunteer would be expected to intercept a site-related soil vapor plume at the property line (as would be expected with a groundwater plume). Off-site impacts resulting from contamination migrating from a BCP Volunteer's property will be addressed by the NYSDEC in accordance with the BCP. The NYSDEC, in cooperation with the NYSDOH, is responsible for notifying off-site property owners that the potential for soil vapor intrusion may need to be evaluated on their properties. The responsibility for subsequent costs will be determined by the NYSDEC. [See also Comment A.6.5.]

Comment A.11.2:

The Draft SVI [Soil Vapor Intrusion] Guidance does not seem to take into account that there are stages in the investigation process in which NYSDEC may determine that the Potentially Responsible Party (PRP) is not responsible for further investigation. Such decisions must be made on a site-by-site basis by the NYSDEC personnel responsible for the investigation and remediation. For example, one indoor air sample or groundwater sample or soil vapor sample may lead to a determination that soil vapor intrusion is not an issue at a particular site. It is very important that the NYSDEC have the flexibility to make determinations based on actual site conditions and experience.

Response A.11.2:

The NYSDEC, in consultation with the NYSDOH, makes decisions based on "actual site conditions," among other factors, and uses the guidance to help make those decisions. Should the agencies determine, based on an evaluation of all the available data, that soil vapor intrusion is not an issue or potential issue of concern (e.g., should property use change) at a particular site, then the property owner or responsible party has no further obligation regarding soil vapor intrusion. On the other hand, should the agencies determine, based on an evaluation of all the available data, that soil vapor intrusion is an issue or potential issue of concern beyond the site's boundaries, the NYSDEC will decide who is responsible for further investigation and any necessary remediation.

Comment A.11.3 (paraphrased, 1 commenter, 1 comment):

This guidance requires outdoor air samples to be taken simultaneously with indoor air samples. However, time-specific background readings have little relationship to same-time indoor air readings; ambient background levels can vary widely over time and during the course of a day. The exchange between indoor and outdoor air is not instantaneous. A distinction needs to be made between a homeowner's, a PRP's, and the state's responsibilities. If sub-slab vapor concentrations are below indoor air action levels, no additional action is necessary by the PRP. Any additional action becomes the responsibility of the homeowner or the NYSDOH.

Response A.11.3:

As discussed in Section 3 of the guidance, outdoor air results are one of many factors considered when determining the likely source(s) of volatile chemicals to the indoor air and the appropriate steps to address exposures (if necessary). If the agencies determine, based on an evaluation of all the available data, that soil vapor intrusion is not an issue or potential issue of concern (e.g., should property use change) at a particular site, then the property owner or responsible party has no further obligation regarding soil vapor intrusion. In general, if indoor exposures represent a concern due to indoor sources, then the State (not the PRP) will provide guidance to the property owner and/or tenant on ways to reduce their exposure. If indoor exposures represent a concern due to outdoor sources, then the NYSDEC will decide who is responsible for further investigation and any necessary remediation. Depending upon the outdoor source, this responsibility may or may not fall upon the PRP.

Comment A.11.4 (paraphrased, 8 commenters, 14 comments):

The guidance may impose mitigation and remedial obligations on a party where the indoor air impacts do not result from soil and groundwater contamination, or from subsurface sources alone.

Response A.11.4:

As discussed in Section 3 of the guidance, many factors are considered when determining the likely source(s) of volatile chemicals to the indoor air and the appropriate steps to address exposures (if necessary). To the extent that site data and site conditions demonstrate that soil vapor intrusion is not occurring and that the potential for soil vapor intrusion to occur is not likely, the vapor intrusion investigation would be considered complete. In general, if indoor exposures represent a concern due to indoor sources, then the State will provide guidance to the property owner and/or tenant on ways to reduce their exposure. If indoor exposures represent a concern due to outdoor sources, then the NYSDEC will decide who is responsible for further investigation and any necessary remediation. Depending upon the outdoor source, this responsibility may or may not fall upon the party conducting the soil vapor intrusion investigation.

**A.12 TOPIC: Resources**Comment A.12.1 (paraphrased, 1 commenter, 1 comment):

Given how extensive this guidance is, it is unclear what NYSDOH staff are available to advise on and review soil vapor activities and documentation. We are concerned that long delays will impede timely investigations. Who will be responsible for performing investigations, evaluating data, and oversight? Does the NYSDOH have adequate resources to do this?

Response A.12.1:

Generally, the responsibility for conducting soil vapor intrusion investigations will vary depending upon the environmental remedial program (e.g., State, EPA, PRP, Volunteer, etc.). In all cases, regulatory staff will evaluate data generated to determine the appropriate next course of action. Regulatory staff review and approve site-specific work plans and reports. Staff are also available to provide guidance in developing these plans and reports. While delays in site investigations are certainly possible, the NYSDEC and NYSDOH are working cooperatively to conduct soil vapor intrusion evaluations as efficiently and effectively as possible.

Comment A.12.2 (paraphrased, 1 commenter, 1 comment):

If a soil vapor investigation will be required at every site with a soil or groundwater exceedance of Technical and Administrative Guidance Memorandum (TAGM) or Technical Operating Guidance Series (TOGs) for VOCs, requiring detailed NYSDOH review and approval of data and potential future site requirements in support of the NYSDEC, how will the NYSDOH provide staff for such oversight at all these sites to ensure that issues are resolved in a timely manner?

This guidance will require a significant increase in regulatory staffing and funding to address the prior approval or discussion requirements of the guidance, such as discussion with agency prior to conducting modeling, prior approval for modifications to the prescribed sampling protocols, prior approval for proposing alternative sources of volatiles in indoor air, and approval for alternative mitigation systems. Delays in the investigation and cleanup of sites with VOCs will occur unless sufficient resources are procured prior to implementing this guidance in this form.

Response A.12.2:

Investigating the potential for soil vapor intrusion is a cooperative effort between the NYSDEC, NYSDOH, EPA at federal sites, and the responsible party. The NYSDEC and NYSDOH encourage parties to consider the guidance when developing investigation work plans in order to expedite the entire review and approval process by reducing the necessity for repeated comment letters and conference calls between the agencies and environmental consultants. Prior to the development of this guidance and the decision matrices therein, the evaluation of results could be time consuming. The State believes that once all parties become more familiar with the guidance, any delays will be reduced. [See also Comment A.13.1.]

Comment A.12.3 (paraphrased, 2 commenters, 3 comments):

We are concerned about the reality of ubiquitous chlorinated solvent contamination in aquifers in certain urban areas in our state. To be consistent with requirements for privately remediated and developed sites, will the NYSDOH fund soil vapor investigations and remediation for New York State areas with known regional groundwater contamination? For properties overlying regional groundwater plumes, this guidance appears to place the burden of investigation and remediation on the property owners, prospective buyers, or developers of individual properties within a regional groundwater plume.

Response A.12.3:

In general, the State will request responsible parties to conduct soil vapor intrusion evaluations at their sites. In locales where there may not be a viable responsible party or where the source of the contamination is unknown, the State will conduct the vapor intrusion evaluations as appropriate where the potential for significant threat exists for the protection of human health.

Comment A.12.4 (paraphrased, 1 commenter, 1 comment):

We are concerned that installation of a mitigation system into an existing building could get quite expensive. The NYSDOH should make a case that there are public health benefits as a result of such measures, and should provide realistic urban background concentrations and conditions before going forward with a program of this nature.

Response A.12.4:

In the State's experience, sub-slab depressurization systems have been proven to be up to 99 percent effective in preventing vapor intrusion and therefore, result in a significant reduction in human exposure via soil vapor intrusion.

During an investigation of potential vapor intrusion, outdoor air samples must be collected to identify any potential background interference (i.e., actual urban background, etc.) that are considered in determining the need for recommended actions.

Comment A.12.5 (paraphrased, 1 commenter, 1 comment):

You are the only Federal or State agency I know of that has put no distance criteria in their site screening criteria. This will bring in an enormous amount of sites. Who is to pay for all of this?

Response A.12.5:

At all current and new remedial sites in New York, soil vapor, like soil and groundwater, will be evaluated, as part of on-going and proposed site investigation. The evaluation of the soil vapor intrusion pathway will proceed in a similar fashion to the evaluation of other environmental media of concern (soil, groundwater) and will be performed by the appropriate party, which may include the State of New York, the EPA or a responsible party. [See also Comment A.8.1 (distance criterion).]

Comment A.12.6 (paraphrased, 1 commenter, 1 comment):

Section 2.2 identifies four types of samples (soil vapor, sub-slab vapor, indoor and outdoor air) and indicates multiple sample locations may be required in a given round. The additional sampling requirements will be very costly.

Response A.12.6:

Comment noted.

**A.13 TOPIC: Tracking systems**Comment A.13.1:

The policy for tracking known contamination so that it does not impact on other sites in the future should be identified. As the issue of vapor intrusion has demonstrated, contaminants continue to migrate through soil and groundwater, resulting in exposures in areas far removed from the origin of the contaminant release. While the preference should be to remediate the source, there remains the potential for vapor intrusion as has been witnessed at several federal and State superfund sites. To minimize future impacts, the final Guidance should include a reference to the measures that will be taken by the State to track and remediate such contamination, as provided in the Brownfield Cleanup Program.

Response A.13.1:

The potential for the off-site migration of on-site contamination is typically identified in the site investigation process. How the migration is managed, and by whom (e.g., State, EPA, PRP, Volunteer, etc.) depends upon the environmental remediation program. Generally, it is addressed in site management plans (formerly referred to as operation, maintenance and monitoring plans) and reports for a site. For example, at sites with groundwater contamination, if there are concerns for exposure (e.g., off-site private residential wells), groundwater sampling locations are selected to monitor the potential for groundwater migration toward those residences. If there are concerns about on-site contamination migrating off-site in the future, groundwater is monitored at the site's boundary. The results of these monitoring programs are submitted to the State. If the monitoring results indicate a need for additional actions to evaluate exposures or to investigate or remediate the environmental contamination further, then appropriate actions are taken. In addition to OM&M activities, institutional controls may be used to prevent exposures related to residual contamination (e.g., groundwater use restrictions). Soil vapor contamination should be addressed in an analogous manner.

**A.14 TOPIC: Access issues**Comment A.14.1 (paraphrased, 2 commenters, 3 comments):

The guidance does not address access issues. Because many groundwater plumes may have migrated under private residences or buildings, the guidance document should contain protocols for obtaining access and communicating the potential risk to residents or building workers from vapor intrusion.

Response A.14.1:

Protocols for obtaining access to private properties are outside the scope of this guidance document. However, in our experience, access is rarely denied. When a property owner has been reluctant to grant access or has outright refused access for whatever reason, the State has found that access might be gained following a phone call, letter, or meeting between the property owner and the NYSDEC and/or NYSDOH. Situations where reasonable actions have been taken to gain access, but access continues to be denied, are addressed on a site-specific and building-specific basis. In some cases, subject to the NYSDEC and NYSDOH's approval, decisions pertaining to appropriate actions may need to be made without sampling a particular property and by using other investigation results and information known about the site. As always, any problems obtaining access should to be brought to the attention of the NYSDEC and NYSDOH so that the agencies might facilitate a favorable outcome.

The guidance provides a discussion on community outreach methods in Section 5 and includes fact sheets that provide limited health risk information. As discussed in Section 5, there are many different approaches to risk communication and outreach. The type, or types, of techniques selected for a site will vary depending upon the community's needs, site-specific conditions and remedial program-specific requirements. Once indoor air and outdoor air results are obtained, the NYSDOH can provide chemical-specific health risk information based on the volatile chemicals identified, their concentrations, and exposure potential.

Comment A.14.2 (paraphrased, 1 commenter, 1 comment):

The guidance allows soil vapor sampling external to buildings only for scoping of internal investigations (sub-slab vapor and indoor air sampling), and not for final determinations, attributed to the "hit-and-miss" nature of soil vapor data (Section 3.3.1). Due to ownership issues, concerns about floor damage, and other access constraints, it is not always feasible to perform sampling in or under the target structure. Requiring building access could significantly impede the ability of Responsible Parties to obtain site closure or complete real estate transactions and may represent an unreasonable burden. A soil vapor sample directly outside a building and at an appropriate depth would generate valid data for final determinations.

Response A.14.2:

The State acknowledges that obtaining access to properties under investigation can be difficult at times. However, our experiences indicate that these instances are not widespread and at times can be worked out by a phone call, letter, or meeting between the property owner and the NYSDEC and/or NYSDOH. Situations where reasonable actions have been taken to gain access, but access continues to be denied, are addressed on a site-specific and building-specific basis. In some cases, subject to the NYSDEC and NYSDOH's approval, decisions pertaining to appropriate actions may need to be made without sampling a particular property and by using other investigation results and information known about the site. Even in these cases, soil vapor results are still not used as the sole factor in determining appropriate actions (as

discussed in Sections 2.2.1 and 3.3.1 of the guidance). Rather, soil vapor results are considered in conjunction with many factors including, but not limited to, soil results, groundwater results, sub-slab vapor results at adjacent properties, and identified or likely preferential pathways. [See also Comment D.10.6.]

### **A.15 TOPIC: Privacy issues**

#### Comment A.15.1 (paraphrased, 1 commenter, 1 comment):

Discuss privacy issues for home and business owners. For example, how and with whom should Indoor Air Questionnaires be filed? How should samples be identified to avoid use of addresses and public release of monitoring data in site characterization reports? For contractors working for private clients, other state agencies, or federal agencies, what are the minimum reporting requirements for the NYSDOH?

#### Response A.15.1:

In order for the State to evaluate the potential for soil vapor intrusion thoroughly, all data collected during sampling, including the completed Indoor Air Questionnaires, should be submitted to the State. Sample identifiers are determined on a site-by-site basis, with consideration of occupant and owner privacy issues. Once the information is submitted to the State it becomes public information. The State makes every reasonable attempt to protect the privacy of individual structure owners and occupants where it legally can. For example, maps displayed at public meetings that have results of structure sampling are constructed in a manner that they display pertinent information while protecting privacy to the maximum extent possible. Sampling reports that are released to the public may contain generic identifiers (e.g., Residence 1).

### **A.16 TOPIC: Presumptive remedies**

#### Comment A.16.1 (paraphrased, 2 commenters, 4 comments):

The guidance sets up a very comprehensive and rigorous framework for investigation of soil vapor and the implementation of remedial measures. However, it should also discuss the option of implementing presumptive remedies without the need for investigation. For example, a developer may wish to avoid time-consuming and costly sampling by designing and installing mitigation measures. Another example would be if VOCs are present in soil, or groundwater, or soil vapor, and a decision is reached that a potential exposure scenario and unacceptable risk may exist, the affected party should be allowed to proceed with active mitigation in lieu of indoor air sampling or exhaustive soil vapor sampling.

#### Response A.16.1:

Measures to mitigate exposures or to remediate subsurface vapor contamination can be considered at any time during the investigation and remediation of a site. Implementation of such measures may eliminate or limit the need for soil vapor intrusion investigations. These determinations are made on a site-specific basis.

### **A.17 TOPIC: Exit strategies**

#### Comment A.17.1:

The document is not clear enough about exit strategies. It should provide guidance about items such as how to screen sites for various mitigation actions, when sampling activities

can be considered completed, and when a mitigation or monitoring system can be turned off. For example, Section 2.5 indicates that more than one round of sampling may be necessary due to various concerns. Several factors are given for condition variance. Who will determine when a sufficient number of rounds have been complete? If the first round indicates there is no problem, will that be sufficient? Where the above information is provided or an undeveloped site has mitigation designed into the construction based on either data or prevention, the data should be considered sufficient for [NYS]DOH to provide an approval, signoff, or closure of an issue.

Response A.17.1:

Both the NYSDEC and NYSDOH, in consultation with other involved agencies, will make the determination of when adequate data has been gathered to move to the next step. Designing mitigation measures into future construction is always a good approach. Implementation of such measures may eliminate or limit the need for soil vapor intrusion investigations. These determinations are made on a site-specific basis. [See also Part C.6 (TOPIC: Number of sampling rounds required) and Part E.7 (TOPIC: Termination of mitigation system operations).]

**A.18 TOPIC: Opportunities to review proposed guidance**

Comment A.18.1 (paraphrased, 3 commenters, 4 comments):

The document should outline the process by which the regulated community and other stakeholders can review new air guidelines, matrices, and updates to the guidance document.

Response A.18.1:

The development of air guidelines is not within the scope of the guidance. Opportunities for the public to comment on new air guidelines will be determined at the time of the guideline's development and the public will be notified accordingly.

Revisions or amendments (e.g., new matrices) to the guidance will be posted on the NYSDOH's web site. The web address is provided in the "New York State Departments of Health and Environmental Conservation — Web Sites on Soil Vapor Intrusion" section at the beginning of the guidance. Revisions or amendments may also be announced by other means (e.g., the Environmental Notice Bulletin). The State does not expect to designate formal, set comment periods with these releases. Rather, comments and questions may be sent at any time to the NYSDOH's Bureau of Environmental Exposure Investigation (see the "Contact Information" section at the beginning of the guidance). Comments received will be considered for any future updates of the document. Information about the State's web sites, the availability of materials, and the submission of comments or questions has been added to the guidance. At the time any changes are made, and when appropriate, information on how to comment will be provided.

**A.19 TOPIC: IBM Endicott site**

Comment A.19.1 (paraphrased, 1 commenter, 1 comment):

We encourage the NYSDOH to discuss what happened at Endicott, NY, to give the guidance more credibility with the regulated community. The NYSDOH has published a useful link to events at Endicott on its web site at <http://www.health.state.ny.us/nysdoh/gas/soilgas.htm>, but this site is nowhere found in the soil vapor guidance. The NYSDOH should more

thoroughly describe the range of TCE values found at Endicott, how they are above NYSDOH guidance but below levels that will harm human health, and describe how the indoor air concentrations in Endicott homes differed from what the NYSDEC and NYSDOH anticipated would be found from the remediated IBM groundwater plume.

Response A.19.1:

Data collected from the evaluation of sites across New York to date indicate that each site is unique and that the approach to evaluating soil vapor intrusion is dependent upon site-specific characteristics. The guidance is intended to present generic steps and strategies that may be applied when approaching an investigation of soil vapor intrusion. While the data set from the Endicott site is the most extensive soil vapor intrusion data set in New York to date, the State does not intend to incorporate the Endicott site data, or other specific site data, into the guidance as this is inconsistent with the general approach and intent of the guidance. The guidance has not been revised in response to the comment.

**A.20 TOPIC: Miscellaneous editorial comments**

Comment A.20.1:

Chapters 2, 3 and 4 should be re-structured to eliminate multiple redundancies.

Response A.20.1:

These sections describe several phases of a soil vapor intrusion evaluation, which are generally performed to meet the same stated objectives. Therefore, some redundancy is inherent. Should portions of the document be used without reference to other sections, this redundancy will allow for follow through of important objectives without jeopardizing the relevance of the information gathered. The guidance has not been revised in response to this comment.

Comment A.20.2:

References to other sections require verification. For example:

Pg. 35 – Reference to occupational exposures should be Section 2.12, not 2.11.

Pg. 39 – Reference to sampling during heating season should be Section 2.4, not 2.6.3.

Response A.20.2:

Cross-references in the guidance have been checked and revisions have been made, including the corrections mentioned in the comment.

Comment A.20.3:

Section 3.4.2, fourth sentence: Insert "be" between "will developed."

Response A.20.3:

Comment noted.

**A.21 TOPIC: References in guidance**

Comment A.21.1:

Throughout the document, references to peer-reviewed scientific literature and other pertinent background information, including the EPA website and guidance on vapor

intrusion should be included. For example, the first four references following Table 3.1 (used to set NYSDOH air guideline values) are not available on the NYSDOH website and should be provided in full. The use of "letters" and "re-entry guidelines" to set policy is questionable, and in addition these documents are also 17-20 years old.

Response A.21.1:

References are included as appropriate. For copies of any references that are not currently posted on the NYSDOH's web site, please contact the NYSDOH and we will provide copies to the requester (see the Contact Information section at the beginning of the guidance). Guidance documents are dated the year they were implemented and are only updated as needed. The guidance has not been revised in response to the comment.