Response to Public Comments – Support Document

Addition of a Subsurface Intrusion Component to the Hazard Ranking System Final Rule

December 2016

Site Assessment and Remedy Decisions Branch
Office of Superfund Remediation and Technology Innovation
Office of Land and Emergency Management
U.S. Environmental Protection Agency
Washington, DC 20460

Table of Contents

Introduction

The U.S. Environmental Protection Agency (EPA) is adding a subsurface intrusion (SsI) component to the Hazard Ranking System (HRS), which is the principal mechanism that EPA uses to evaluate sites for placement on the National Priorities List (NPL). The NPL is a list of national priorities among the known or threatened releases of hazardous substances, pollutants or contaminants throughout the United States. Sites on the NPL are priorities for further investigation to determine if further response actions are warranted. The subsurface intrusion component (this addition) expands the number of available options for EPA and state and tribal organizations performing work on behalf of EPA to evaluate actual and potential threats to public health from releases of hazardous substances, pollutants, or contaminants. This addition enables EPA to directly consider human exposure to hazardous substances, pollutants, or contaminants that enter regularly occupied structures through subsurface intrusion in assessing a site's relative risk, and thus, enable sites with subsurface intrusion contamination to be evaluated for placement on the NPL.

EPA published the proposed rule titled, Addition of a Subsurface Intrusion Component to the Hazard Ranking System, on February 29, 2016 (81 FR 10372). The public comment period was open from that date through April 29, 2016. EPA received comments from 15 parties. EPA has thoroughly reviewed and thoughtfully considered all comments received. This document compiles the significant comments received on the proposed rule and provides agency responses. In cases where a comment resulted in a change in the final rule, that is noted in the agency's response.

The comments are presented by comment submittal in a table format showing the significant comments as submitted with EPA's corresponding response. A glossary of acronyms and abbreviations is provided as an aid to readers. A complete list of public commenters and the docket numbers associated with each commenter submittal is provided, prior to the comments and responses.

The subject of some comments were not on the SsI component scoring process and therefore were neither the subject of, nor within the scope of this rulemaking. EPA has provided responses to some of those comments only for the purpose of providing proper context for reviewing the given responses to the comments, such as: further explaining how the SsI component is consistent in structure and concept with other HRS pathways and components, how its addition does not alter the status of sites on the NPL based on evaluations using other HRS pathways, the possibility of re-evaluation of sites using the amended HRS, how the HRS is used to identify sites for the NPL, the purpose of the NPL, and the role the HRS and the NPL play in the overall Superfund program.

This Support Document is part of the docket for the EPA's Final Rule for the Addition of a Subsurface Intrusion Component to the Hazard Ranking System published in the Federal Register in January 2017. The Preamble to the Final Rule provides a detailed description of the regulatory authority, background, rationale, and content of this action, as well as the regulatory language.

Glossary of Acronyms and Abbreviations

ACC	American Chemistry Council
ACH	Air changes per hour
AER	Air exchange rate
Agency	U.S. Environmental Protection Agency
AOE	Area of Observed Exposure
ASC	Area of Subsurface Contamination
ASTSWMO	Association of State and Territorial Solid Waste Management Officials
ATSDR	Agency for Toxic Substances and Disease Registry
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. Sections 9601 *et seq*., also known as Superfund
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
CPEO	Center for Public Environmental Oversight
CPTD	American Chemistry Council's Chemical Products and Technology Division
CSM	Conceptual site model
DEP	Department of Environmental Protection
DEQ	Department of Environmental Quality
DNAPLs	Dense non-aqueous phase liquids
DNR	Department of Natural Resources
DoD	U.S. Department of Defense
ECD	Electron capture detector
EPA	U.S. Environmental Protection Agency
ESI	Expanded site inspection
FEMA	Federal Emergency Management Agency
FR	Federal Register
FS	Feasibility study
FTE	Full-time employee
FUDS	Formerly Used Defense Sites
FY	Fiscal year
GAO	Government Accountability Office
GC	Gas chromatograph
GC-MS	Gas chromatography–mass spectrometry
GW	Ground water

HRS	Hazard Ranking System, Appendix A of the NCP
HRS score	Overall site score calculated using the Hazard Ranking System; ranges from 0 to 100
HVAC	Heating, ventilation and air conditioning
ITCR	Interstate Technology and Regulatory Council
IUR	Inhalation unit risk
LNAPLs	Light non-aqueous phase liquids
µg/L	Microgram per liter
MLE	Multiple lines of evidence
MNA	Monitored natural attenuation
NAPLs	Non-aqueous phase liquids
NCP	National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300
NGWA	National Ground Water Association
NPL	National Priorities List, Appendix B of the NCP
O&M	Operations and maintenance
OLEM	EPA's Office of Land and Emergency Management
OSWER	Office of Solid Waste and Emergency Response
PA	Preliminary assessment
PBPK	Physiologically-based pharmacokinetic model
PCE	Tetrachloroethylene
PLCAG	Pompton Lakes Community Advisory Group
PRP	Potentially responsible party
PVI	Petroleum hydrocarbon
RCRA	Resource Conservation and Recovery Act
RfC	Reference concentration
RfD	Reference dose
RI	Remedial investigation
RIA	Regulatory impact analysis
SARA	Superfund Amendments and Reauthorization Act
SCDM	Superfund Chemical Data Matrix
SEMS	Superfund Enterprise Management System
SI	Site inspection
SsI	Subsurface intrusion
SSP	Superfund Settlements Project
TCE	Trichloroethylene
TCEQ	Texas Commission on Environmental Quality
TSD	Technical Support Document

UFP-QAPP	Uniform Federal Policy for Quality Assurance Project Plans
USGS	United States Geological Survey
UST	Underground storage tank
USWAG	Utility Solid Waste Activities Group
VI	Vapor intrusion
VISL	Vapor intrusion screening level
VOC	Volatile organic compounds

List of Commenters and Correspondence

Submittal ID	Submitter	Organization	Type
EPA-HQ-SFUND-2010-1086-0082	James R. Roewer	Utility Solid Waste Activities Group (USWAG)	Correspondence
EPA-HQ-SFUND-2010-1086-0083	James E. Woolford	U.S. Environmental Protection Agency (EPA)	Correspondence
EPA-HQ-SFUND-2010-1086-0084	Maureen Sullivan	Department of Defense (DoD), Environment, Safety, and Occupational Health	Correspondence
EPA-HQ-SFUND-2010-1086-0085	James E. Woolford	EPA	Correspondence
EPA-HQ-SFUND-2010-1086-0087	Mark Kram, Ph.D.	N/A	Comment
EPA-HQ-SFUND-2010-1086-0088	Richard Hyde	Texas Commission on Environmental Quality (TCEQ)	Comment
EPA-HQ-SFUND-2010-1086-0089	Lenny Siegel	Center for Public Environmental Oversight (CPEO)	Comment
EPA-HQ-SFUND-2010-1086-0090	Daniel F. Norris	N/A	Comment
EPA-HQ-SFUND-2010-1086-0091	Rachel Farnum, P.E.	Rachel Farnum Consulting (on behalf of Pompton Lakes Community Advisory Group (PLCAG))	Comment
EPA-HQ-SFUND-2010-1086-0092	Wes McCall, Geologist	N/A	Comment
EPA-HQ-SFUND-2010-1086-0093	Anonymous	N/A	Comment
EPA-HQ-SFUND-2010-1086-0094	Charles Job	National Ground Water Association (NGWA)	Comment
EPA-HQ-SFUND-2010-1086-0095	Denise Martin	Montana Department of Environmental Quality (DEQ), Waste Management & Remediation	Comment
EPA-HQ-SFUND-2010-1086-0096	Maureen Sullivan	DoD, Environment, Safety, and Occupational Health	Comment
EPA-HQ-SFUND-2010-1086-0097	Kenneth J. Kloo, Director	New Jersey Department of Environmental Protection (DEP), Division of Remediation Management	Comment
EPA-HQ-SFUND-2010-1086-0098	Jennifer Roberts	Association of State and Territorial Solid Waste Management Officials (ASTSWMO)	Comment
EPA-HQ-SFUND-2010-1086-0099	Ronald J. Tenpas	Morgan, Lewis & Bockius LLP (on behalf of the Superfund Settlements Project (SSP))	Comment
EPA-HQ-SFUND-2010-1086-0100	Stephen P. Risotto	American Chemistry Council's (ACC) Chemical Products and Technology Division	Comment
EPA-HQ-SFUND-2010-1086-0101	James R. Roewer	USWAG	Comment

Response to Public Comments

The following tables represent the significant comments as submitted by commenter and EPA's corresponding response. As noted in the introduction, subjects of some comments were not within the scope of this rulemaking; however, responses are included solely for informational and context purposes.

Submitter: 0082 – Utility Solid Waste Activities Group (USWAG)

Public Submission Posted: 03/02/2016

ID: EPA-HQ-SFUND-2010-1086-0082

Comment	Response
The Utility Solid Waste Activities Group ("USWAG") (1) hereby requests a 60-day extension of the comment period for EPA's Notice of Proposed Rulemaking on the Addition of a Subsurface Intrusion [("SSI")] Component to the Hazard Ranking System ("HRS Proposal"). 81 Fed. Reg. 10372 (Feb. 29, 2016). The existing 60-day comment period established in the HRS Proposal will not allow adequate time for members of the public, including USWAG's electric and gas utility members, to respond to the complex technical issues raised in the HRS Proposal. USWAG is an association of electric power generation companies and electric and gas transmission and distribution companies who are directly affected by the Hazard Ranking System ("HRS") rules. USWAG members own and operate thousands of facilities throughout the country, many of which could the subject of site inspections and subsequent scoring under the HRS. The HRS scoring methodology, in turn, dictates whether those sites will be placed on the National Priorities List ("NPL") and has a direct bearing ultimate decisions regarding site cleanup. In 2011, USWAG submitted comments in response to EPA's solicitation of public input on the possible addition of a vapor intrusion component to the HRS. USWAG also participated in EPA's 2011 public listening sessions on this topic. USWAG appreciates the importance of EPA's charge in administering the HRS and understands that the Agency is working to fulfill its obligation to ensure, "to the maximum extent feasible, that the [HRS] accurately assesses the relative degree of risk to human health and the environment posed by sites and facilities subject to review." 81 Fed. Reg. at 10373. However, to achieve this end, any revision to the HRS scoring formula and methodology must reflect meaningful consideration of public input. The value of such public input depends on the public having sufficient time to evaluate EPA's suggested approach in revising the HRS. The proposed addition of an SSI component to the HRS raises many complex technical issues that could have substantial implications for facilities throughout the nation. Public review and comment will not be limited to the threshold question of *whether* indoor groundwater and vapor intrusion should be addressed in evaluating and prioritizing contaminated sites; additional issues on which public input will prove critical relate to *how* any additional component is scored and weighted within the existing framework. As evidenced by the five years that have passed since the Agency first began working towards developing the current proposal, the HRS Proposal involves several complex, highly technical issues warranting careful consideration. Given the potential of the proposed rulemaking to significantly shift the focus of HRS site inspections (and, therefore, impact the composition of the NPL), it is critical that EPA take the time to get this right. Doing so will depend in large part on a meaningful opportunity for public involvement. The extension of an additional 60 days requested herein is especially appropriate where, as here, the Agency has put years' worth of effort into crafting this proposal and is not under any statutory or court-ordered deadline to promulgate a final rule. USWAG therefore respectfully requests that EPA extend the comment period to 120 days from the date of publication in the Federal Register. If you need further information about this request, please contact me or USWAG counsel Allison Foley (202-344-4416; adfoley@venable.com). (1) USWAG, formed in 1978, is an association of over one hundred energy utilities, utility operating companies, energy companies and associations, including the Edison Electric Institute ("EEI"), the American Gas Association ("AGA"), the American Public Power Association ("APPA"), and the National Rural Electric Cooperative Association ("NRECA"). Together, USWAG members represent more than 73% of the total electric generating capacity of the United States, and service more than 95% of the nation's consumers of electricity and 92% of the nation's consumers of natural gas.	*Thank you for your letter, dated March 1, 2016, requesting an extension of the 60-day comment period for the proposed rulemaking to add a subsurface intrusion component to the Hazard Ranking System. This proposed action was published in the Federal Register on February 29, 2016. You requested a 60-day extension of the comment period to allow adequate time for members of the public, including USWAG's electric and gas utility members, to respond to the complex technical issues raised in the proposed rule.* *EPA is denying your request to extend the public comment period. We understand and appreciate your concerns and sincerely value US WAG's input on the proposed rulemaking. The pre-publication version of the proposed rule has been available on EPA's web site since February 4, 2016, the same day that the national press release was issued notifying all interested parties of this proposed action and the availability of information. While we acknowledge that the proposed rule raises technical issues that require consideration, we believe that 60 days plus the additional 25 days that the rule was available prior to publication provides ample time for all interested parties to review the information and prepare comments.* *EPA can guarantee consideration only of those comments postmarked by the close of the comment period on April 29, 2016. We will carefully consider all comments submitted during the comment period before we make a final decision regarding the addition of a subsurface intrusion component to the Hazard Ranking System.*

Submitter: 0084 – Maureen Sullivan, Department of Defense (DoD), Environment, Safety, and Occupational Health

Public Submission Posted: 03/23/2016

ID: EPA-HQ-SFUND-2010-1086-0084

Comment	Response
The Department of Defense (DoD) is writing to request a 60-day extension of the comment period on the Environmental Protection Agency's proposed rulemaking "Addition of a Subsurface Intrusion Component to the Hazard Ranking System." The existing 60-day comment period established in the proposal will not allow adequate time for DoD to respond to the lengthy and complex proposed rule modifying the Hazard Ranking System (HRS). The proposed addition of a subsurface intrusion component to the HRS raises many complex technical issues that could have substantial financial implications for DoD. Additionally, to adequately review the technical supporting documents will take considerable time to determine the proposed rule's usability and defensibility for scoring sites for inclusion on the National Priority List (NPL). Given the potential for the proposed rulemaking to significantly increase current preliminary assessment and site inspection data collection and investigation procedures and the potential to rescore sites that did not previously score high enough to be listed on the NPL, it is critical that there is meaningful opportunity for comment. The requested 60-day extension will not cause harm or delays because EPA is not under any statutory or court-ordered deadline to promulgate a final rule. DoD therefore respectfully requests that EPA extend the comment period to 120 days from the date of publication in the Federal Register. My point of contact for this issue is Ms. Deborah Morefield, who can be reached at (703) 571-9067, deborah.a.morefield,civ@mail.mil. Please contact her if you have any questions or if you need additional information.	*Thank you for your letter, dated March 21, 2016, requesting an extension of the 60-day comment period for the proposed rulemaking to add a subsurface intrusion component to the Hazard Ranking System. EPA published this proposed action in the Federal Register on February 29, 2016. You requested a 60-day extension of the comment period to allow adequate time for Department of Defense (DoD) to respond to the lengthy and complex proposed rule.* *EPA is denying your request to extend the public comment period. We understand and appreciate your concerns and sincerely value DoD's input on the proposed rulemaking. DoD had many opportunities to raise concerns during the six-month interagency review period prior to the proposed rule's publication. The interagency review concluded on December 21, 2015, at which time EPA provided a redline/strikeout version of the proposed rule incorporating revisions based on DoD's concerns (see document number EPA-HQ-SFUND-2010-1086-0067 in http://www.regulations.gov). While we acknowledge that the proposed rule raises technical issues that require consideration, we believe that the six-month interagency review period, the additional two-month period prior to publication plus the 60-day comment period all provide ample time for DoD to review the information and prepare comments.* *EPA can guarantee consideration only of those comments postmarked by the close of the comment period on April 29, 2016. We will carefully consider all comments submitted during the comment period before we make a final decision regarding the addition of a subsurface intrusion component to the Hazard Ranking System.*

Submitter: 0087 - Mark Kram, Ph.D.

Public Submission Posted: 04/12/2016

ID: EPA-HQ-SFUND-2010-1086-0087

Comment	Response
The purpose of this note is to support USEPA's efforts to include consideration of vapor intrusion in their Hazard Ranking System (HRS), and to express my concerns about currently accepted vapor intrusion characterization and monitoring practices. Continued regulatory acceptance of traditional point-in-time and time-integrated assessment and monitoring methods will result in flawed HRS conclusions and regulatory decisions, additional public sector costs for legal expenses, and could threaten the health of citizens on a national scale.	*EPA has added the SsI component to the HRS. EPA acknowledges the commenter's support for the HRS SsI Addition. Regarding the commenter's concern that point-in-time and time-integrated assessment and monitoring methods are unsuitable for use, the HRS SsI Addition is a screening tool designed to use limited data to determine if a site is eligible for placement on the NPL, which is a determination that a site is likely to pose sufficient risk relative to other sites evaluated to warrant further investigation and potentially remedial action under CERCLA. The HRS SsI Addition does not mandate collection methods for data to be used in an HRS evaluation, which allows for consideration of any advances in technology or changes in the state of the science as it pertains to subsurface intrusion without needing to revise the HRS. Discussion of data collection methods is an appropriate topic for any future guidance for implementing the HRS SsI Addition.*
I strongly support the proposal to add a subsurface intrusion component to the HRS. Vapor intrusion sites that pose a risk do not currently qualify for NPL status based on the current HRS criteria. This proposal represents a practical and pragmatic position, as vapor intrusion, particularly as it relates to acute risks associated with Trichloroethylene (TCE) exposures, became an acknowledged risk driver long after the HRS was initially established. As such, it makes perfect sense that vapor intrusion risks should be considered when prioritizing sites for remediation and financial support. I am in agreement with the agency's position that including the evaluation of subsurface intrusion in the HRS serves the public interest by widening EPA's ability to evaluate and resolve these threats.	*EPA has added the SsI component to the HRS. EPA acknowledges the commenter's support for the HRS SsI Addition.*
While I strongly support the proposal to add a subsurface intrusion component to the HRS, I remain concerned that the currently accepted methods for evaluating subsurface vapor intrusion risks yield flawed conclusions. For instance, for many years practitioners have been documenting that subsurface and indoor vapor concentrations can exhibit extreme dynamics due to natural and anthropogenic causes such as changes in barometric pressure, soil moisture and building ventilation (Rossabi, 1999; CIRIA, 2007; Kram et al., 2011; Kram, 2015, ASTM, 2013; Holton et al., 2013; USEPA, 2012; and USEPA, 2015). As a result, traditional point-in-time and time integrated sampling approaches have a propensity to yield false negative and false positive conclusions and are not capable of yielding worst case risks (Kram, 2015; USEPA, 2015). Furthermore, while a 24-hour TCE exposure duration is sufficient to cause cardiac malformation in an unborn fetus whose mother is exposed during the first trimester of pregnancy (USEPA, 2011), traditional methods typically require days to weeks before a response can be initiated. Therefore, implementation of these approaches results in harmful exposures. As such, I strongly encourage EPA to revisit this critical issue, to require methods during the Site Inspection (SI) that more effectively protect women and children before an exposure duration threshold has transpired, and to incorporate these considerations into the proposed revisions to the HRS. At present, the traditional methods included in EPA vapor intrusion guidance (USEPA, 2015) continue to yield flawed conclusions. If regulatory acceptance of these methods continues, characterizations will be incorrect and undetected harmful exposures will result.	*EPA agrees with the commenter that EPA cannot determine actual exposure levels for all possible receptors at candidate NPL sites, or perform an accurate site-specific risk assessment at each candidate site, based on a time-limited screening assessment because of the temporal and spatial variations in subsurface intrusion rates. The HRS, including the SsI component, is designed to not require this level of site-specific data. The concept of the HRS is that it is a relative ranking amongst sites with the purpose of prioritizing sites for further investigation, which will then allow for estimation of actual exposure levels and site-specific risk. This does not mean the HRS does not utilize contaminant concentration data, but that data from a time-limited screening assessment is used to compare concentrations in broad categories across sites. These categories are: no detected levels or levels at or below background, levels between background and below that which indicates a significant increase above background (and hence a release), levels above a health-based benchmark, and levels in concentrations high enough to be associated with NAPLs. HRS site scores reflect these broad ranges of concentration in their ranking. Furthermore, the HRS model also allows scoring of sites where no release has been documented, to assign scores when receptors are potentially exposed, but assigns lower site scores to these situations based on basic contaminant transport concepts. EPA considers it appropriate that sites be prioritized based on these broad categories of contaminant concentrations and situations.* *Regarding the comments on short-term exposures to hazardous substances, EPA notes that if during a site assessment for performing an HRS evaluation, acute risks are identified, EPA would exercise its removal authority to respond to these risks, notifying the appropriate local or state authorities, and response actions would not be delayed until the Superfund remedial program evaluation is completed.*
With respect to the HRS, the EPA states "HRS is a scoring system used to assess the relative risk associated with actual or potential releases of hazardous substances from a site based on the information that can be collected in a limited, typically one to two day site inspection (SI)." I submit to you that a one to two day site inspection is often insufficient to properly evaluate vapor intrusion risks because concentrations and risk conditions are dynamic and the frequency of change differs based on site specific conditions. As such, it is recommended that new HRS regulatory requirements be developed to determine potential vapor intrusion risks over a more	*As explained above, EPA considers the HRS and the SsI component now added to it of sufficient accuracy to prioritize sites for further investigation, based only on rudimentary site data. EPA agrees that if professional judgment indicates the HRS evaluation to be inadequate to protect human health, or if new data is gathered that indicates a greater threat, EPA can resample sites to collect further information and reassess the site by repeating the HRS evaluation.* *Furthermore, the HRS does not mandate the methods used for data collection, the frequency or duration of data collection, or*

Comment	Response
representative duration to most effectively protect public health against potential worst case.	*how much data must be collected to perform an HRS assessment, to allow for any advances in technology or changes in the state of the science as it pertains to subsurface intrusion. The HRS is a tool used to evaluate collected data. Discussion of sampling methods is an appropriate topic for any future guidance for implementing the HRS SsI component.*
In order to improve the probability of developing a more accurate evaluation of potential acute risks, I recommend that the timing of each SI campaign be dictated by the timing of an anticipated drop in barometric pressure due to an approaching storm, and that the data be collected continuously over the entire duration of the investigation (e.g., as the storm approaches through the passing of the storm) using currently available laboratory grade instrumentation equipped with real-time alerting and response capabilities. For instance, a gas chromatograph (GC) with an electron capture detector (ECD) multiplexed to allow for automatic analysis of samples collected from up to 16 locations with a single instrument is now commercially available. The data is mapped in real-time, and if risk thresholds are exceeded, an alert can be automatically delivered to designated personnel, and a response (e.g., immediate evacuation, engagement of blowers, etc.) can be engaged within one minute of detection. Because the system has been automated, multiplexed, and integrated with data processing and visualization and alerting components, costs have been reduced to the point where they are extremely competitive with (and even less than) traditional approaches for sites requiring multiple data collection points (e.g., neighborhoods, large buildings, schools, etc.) and longer monitoring durations (e.g., one month or longer).	*Regarding conducting an SI, the HRS does not mandate the methods used for data collection, the frequency or duration of data collection or how much data must be collected to perform an HRS assessment or to allow for any advances in technology or changes in the state of the science as it pertains to subsurface intrusion. The HRS is a tool used to evaluate collected data. The commenter has provided helpful considerations for sample collection as it pertains to vapor intrusion, which will be considered when developing any future guidance on the implementation of the HRS SsI component.*
I raise these points because I am convinced that while modifying the HRS to account for vapor intrusion risks is warranted, using currently accepted traditional characterization methods described in recent EPA guidance (USEPA, 2015) will result in inaccurate HRS scores. In fact, EPA acknowledges that dynamics occurs. In addition, conventional methods have been demonstrated to exhibit a high probability of yielding false negative results (Holton et al., 2013). Furthermore, traditional vapor intrusion characterization methods do not afford the ability to protect people from acute exposures rapidly enough to avoid the 24-hour duration of concern. As such, a new category of ranking may have to be incorporated into the HRS to reflect the need for immediate action in order to avoid acute risks for women of child-bearing age. In addition, continuous monitoring methods allow for estimates of chronic risk determinations that are defensible because they are not susceptible to flaws associated with traditional time-integrated methods that rely on selection of appropriate materials to optimize uptake rates. Now that costs for more appropriate continuous monitoring methods are competitive with traditional methods, it behooves EPA to adopt strategies that endorse (and even require) more accurate continuous monitoring and response technologies and approaches.	*EPA agrees with the commenter that EPA cannot determine actual exposure levels for all possible receptors at candidate NPL sites, or perform an accurate site-specific risk assessment at each candidate site, based on a time-limited screening assessment because of the temporal and spatial variations in subsurface intrusion rates. The HRS, including the SsI component, is designed to not require this level of site-specific data. The concept of the HRS is that it is a relative ranking amongst sites with the purpose of prioritizing sites for further investigation, which will then allow for estimation of actual exposure levels and site-specific risk. This does not mean the HRS does not utilize contaminant concentration data, but that data from a time-limited screening assessment is used to compare concentrations in broad categories across sites. These categories are: no detected levels or levels at or below background, levels between background and below that which indicates a significant increase above background (and hence a release), levels above a health-based benchmark, and levels in concentrations high enough to be associated with NAPLs. HRS site scores reflect these broad ranges of concentration in their ranking. Furthermore, the HRS model also allows scoring of sites where no release has been documented, to assign scores when receptors are potentially exposed, but assigns lower site scores to these situations based on basic contaminant transport concepts. EPA considers it appropriate that sites be prioritized based on these broad categories of contaminant concentrations and situations.* *Regarding the referenced 2015 EPA Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air, the document was not written to be guidance specifically for the HRS SsI Addition. However, there are concepts included in that guidance that are appropriate for consideration while performing a site inspection (SI) or expanded site inspection (ESI).* *In addition, if during a site assessment for collecting data for an HRS evaluation, SI acute risks are indicated as possible or identified, EPA would exercise its removal authority to respond to these risks, notifying the appropriate local or state authorities, and response actions would not be delayed until the Superfund remedial program evaluation is completed.*
The SARA statutory requirement that EPA amend the HRS to assure "to the maximum extent feasible, that the HRS accurately assesses the relative degree of risk to human health and the environment posed by sites subject to review" dictates that the most appropriate and accurate methods be used to reach conclusions regarding risk. If a vapor intrusion assessment method exhibits a high probability of yielding false negative results because of dynamic risk conditions, the method should no longer be accepted as a determinant of potential risk. Furthermore, all non-representative methods should be excluded from EPA guidance (e.g., USEPA, 2015) and policies defining what constitutes acceptable practice, or be more appropriately classified as screening methods. The sooner this change is implemented, the sooner people will be protected from harmful chronic and acute risks due to TCE exposure. Until that time, false negative results and misrepresentative risk conclusions will continue to prevail.	*The HRS does not dictate the methods used for data collection for use in the SsI component of the HRS. This allows for any advances in technology or changes in the state of the science as it pertains to subsurface intrusion. The HRS is a tool with which to evaluate collected data. Discussion of sampling methods is an appropriate topic for any future guidance for implementing the HRS SsI Addition. The HRS is a screening tool designed to use limited data to determine the relative risk of a site. It is not meant to be a thorough evaluation of a site to determine site-specific risk. The HRS site score determines whether a site is eligible for placement on the NPL, and therefore, is a priority for further investigation. A more extensive and thorough evaluation of site-specific risk would occur during a Remedial Investigation, which is typically performed during a separate stage of the Superfund remedial process.*

Comment	Response
	The referenced EPA guidance document is not written to be guidance for evaluating a site using the HRS SsI component, however, there are elements included in that guidance that are appropriate for consideration while performing an SI or ESI. *Regarding the comment on short-term exposures EPA notes that if, during an SI to collect data for performing an HRS site evaluation, acute risks are identified, EPA would exercise its removal authority to respond to these risks, notifying the appropriate local or state authorities, and response actions are not delayed until the Superfund remedial program evaluation is completed.*

Submitter: 0088 - Texas Department of Environmental Quality (TCEQ)

Public Submission Posted: 04/15/2016

ID: EPA-HQ-SFUND-2010-1086-0088

Comment	Response
Comment 1 – Lack of Concurrent Guidance The proposed rule provides a framework for including the SsI component in the HRS. However, the proposed rule does not provide sufficient information on how it will be implemented and how data will be obtained to evaluate this component. TCEQ staff understands that the EPA intends to publish at least one guidance document that is intended to explain how this proposed rule should be implemented; however this will not occur until after publication of the final rule. Given the absence of this guidance for states to review, the manner in which the EPA intends to implement the rule and obtain the data that is required to perform this evaluation remains unclear. This is especially of concern for new sites in which a significant amount of data regarding the nature and extent of groundwater contamination has not yet been obtained. As such, it is difficult for the TCEQ to provide comments on the proposed rule without being able to concurrently review the accompanying guidance document(s) which are intended to provide the means and methods of subsurface data collection. Based on the potential impacts this guidance may have to state programs, TCEQ recommends that the draft rule not be finalized, until the corresponding guidance is developed so that states may have an opportunity to review and provide comments on these items.	*Promulgation of the HRS SsI Addition does not need to be delayed until guidance documents related to its implementation have been developed. This rulemaking is to add a scoring mechanism to evaluate SsI threats to the HRS—not procedures for implementation of the component into the overall Superfund site assessment process or for the data collection for an SsI component evaluation. As shown in the scoring of 11 Tier 1 sites identified in the technical support document for the rulemaking (the January 14, 2016 document, Technical Support Document for U.S. EPA's Proposed Rule for Addition of a Subsurface Intrusion Component to the Hazard Ranking System, or TSD), sufficient information was available based on a screening level investigation of these sites performed prior to the development of this component to adequately evaluate these sites for the purpose of determining that the SsI component functions in a manner consistent with the other threats, components, and pathways in the HRS, while taking into account the unique parameters impacting the probability of exposure to subsurface intrusion. Additionally EPA notes that during evaluation of the Test Sites, data supporting the various SsI factors generally had been collected using available information obtained during site inspections. Specific guidance for the implementation of the SsI rule and data collection for its scoring are appropriate topics for any future guidance, as such procedures may involve consideration of site-specific conditions or topics of ongoing research and development. Also, EPA notes that EPA's June 2015 Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air, does already contain data collection methods that could be used for preliminary screening.* *Furthermore, to delay addressing sites that may pose a significant human health risk until all necessary guidance documents have been developed would not be consistent with EPA's mandate to protect human health.*
Comment 2 – Data Gaps EPA has solicited input on several data gaps pertaining to the assessment and scoring of the SsI. These data gaps include: determination of presence, extent, and characteristics of biologically active soil to weigh biodegradation factors; determination of dilution and air exchange rates in large buildings as compared to smaller residential structures; and consideration of source strength in performing an SsI evaluation. The TCEQ is concerned that input received will be incorporated into the final rule without additional opportunity to evaluate and comment on data collection and implementation related to these items. TCEQ would recommend not finalizing the rule until after the states have an opportunity to review and comment on how EPA intends to implement these items that may impact state programs.	*Regarding the "data gaps" to which the commenter refers, these were not "data gaps," but rather charge questions on three specific topics for which EPA solicited public input to determine if there were ways to improve the proposed SsI Addition at promulgation. These topics include:* • *determination of the presence and extent of biologically active soil;* • *taking into account the difference in dilution and air exchange rates in large industrial buildings as compared to smaller residential and commercial structures when calculating the hazardous waste quantity; and* • *consideration of source strength in the HRS algorithm.* *In response to the solicitation, the agency did not receive significant feedback that resulted in major revisions to the proposed addition—only minor revisions or no revisions were made related to each topic; therefore EPA finds it inappropriate to delay the rule to allow further comment on these topics. These are identified below and iterated in the specific responses to comments in the final rule support document (this document):* • *In response to comments received on the subject of biologically active soil, the HRS SsI Addition is revised at promulgation to clarify the assumption of the presence of biologically soil in evaluating the degradation factor unless evidence indicates otherwise (see section 5.2.1.2.1.2 of the HRS).* • *In response to comments received on the subject of dilution and air exchange rates in large industrial buildings, EPA did not make any changes to the final rule based on the comments received, as the type of information requested in these comments is generally not available during a typical site inspection. The HRS is a screening tool that uses information available during a site inspection. However, the HRS process does not preclude the use of more structure-specific data to evaluate the SsI pathway if available (e.g., in estimating a Tier A waste quantity).* • *In response to comments received on the subject of source strength, while no commenters proposed a method for determining the source strength over time or suggested specific changes to the HRS algorithm, commenters requested that EPA's attenuation factors address variability in measurements. In response, the agency revised the final rule to include a higher weighting factor value for targets in the area of subsurface contamination (ASC) and when assigning a degradation factor when non-aqueous phase liquids (NAPLs) are present at a site. Additionally, the HRS process does not preclude the use of more structure-specific concentration data to evaluate the SsI pathway if*

Comment	Response
	available (e.g., in estimating a Tier A waste quantity).
Comment 3 – Interim Response Actions The proposed rule states that "generally, EPA considers vapor intrusion mitigation systems as 'interim' or 'early' response actions to promptly reduce threats to human health." The proposed rule also states that "vapor mitigation systems require ongoing monitoring and maintenance throughout the life of the system." The EPA has set a precedent at other sites by agreeing to a specified time for performing the necessary maintenance of the systems. However, it is unclear how the EPA intends for maintenance to be performed for vapor intrusion mitigation systems after the specified time has ended and the systems are still needed in order to address "interim" response actions. Even with focused, aggressive mitigation approaches to remove source areas, vapor intrusion concerns related to lingering groundwater contamination make the prospect of long-term "interim" response actions a reality. The TCEQ seeks clarity on EPA's intent for funding the continued maintenance of the mitigation systems.	*Questions regarding funding of response actions to address SsI releases are unrelated to this rulemaking. This rulemaking deals only with the addition of the proposed HRS SsI component to the HRS; questions on the funding of response actions are not relevant to this action. Therefore, this comment is outside the scope of this rulemaking.* *However, EPA notes that funding of response actions under CERCLA is not changed by this rulemaking.*
Comment 4 – Resource Implications EPA indicates that fewer assessments will be conducted per year and that they do not anticipate more sites will be added to the NPL. From the information currently available, it appears there will be increased resource needs associated with the preliminary assessment and site inspection data collection efforts required for the SsI component evaluation at sites. The TCEQ is concerned that there will be an increased inventory of sites that would not be evaluated by EPA due to limited resources. This may impact state resources and limit the state's ability to address other state Superfund projects. In order to ensure that both EPA and state resources are maximized, the TCEQ again recommends not finalizing the rule until after the states have an opportunity to review and comment on the manner in which EPA intends to implement these items that may impact state programs.	*This comment concerns topics unrelated to this rulemaking. This rulemaking is on the addition of a specific approach for adding consideration of subsurface intrusion threats to the HRS, which is used for evaluating sites for the NPL. Any cost or resource needs resulting from an increase in the number of sites which may need evaluation for placement on the NPL due to this rulemaking is a result of complying with Congress's direction in CERCLA to identify sites on based on risk to the maximum extent feasible. This rule also has no impact on EPA's policy for determining site priorities.* *EPA understands that by adding the SsI component to the HRS the total number of NPL-qualifying sites may increase, and thus the number of sites in CERCLA inventory to evaluate may increase (and may result in adjustment of resource allocations). However, the limit on the resources made available to evaluate these sites is a function of the budget provided to perform these evaluations, which is not a subject addressed by this rulemaking (i.e. the validity of the SsI Addition scoring methodology).*
Comment 5 – Differing Criteria Section 5.2.1.1.2.1 states that populations in structures that show no possible SsI route are not evaluated in this new component. However, the proposed rule includes populations in regularly occupied structures within an area of subsurface contamination (ASC) where indoor air sampling has demonstrated that no observed exposure has occurred. It appears that the proposed rule may be utilizing differing sets of criteria to establish whether populations in occupied structures are exposed or potentially exposed.	*The commenter may be misinterpreting language in the preamble pertaining to the containment factor. Populations in structures within an ASC for which no indoor air observed exposure has been demonstrated are not inherently restricted from scoring. Neither the preamble to the HRS SsI Addition at promulgation nor the SsI component at promulgation contains this statement.* *The commenter's statement that "populations in structures that show no possible SsI intrusion route are not evaluated in this new component" is a direct quote from part of the description of the containment factor in the preamble to the proposed HRS SsI Addition: preamble section VI.3.b.i, Structure Containment, which discusses HRS Section 5.2.1.1.2.1, Structure containment. The language of the proposed HRS itself, Section 5.2.1.1.2.1, Structure containment, provides specific examples of structure features resulting in various structure containment factor values, including those for which a factor value of zero (contained from subsurface intrusion) would be assigned.* *The preamble language at proposal refers to general restrictions on the scoring of target populations associated with structures that are fully contained from intrusion and would receive a containment factor value of zero. This concept was included in the HRS SsI component at proposal in sections such as 5.2.0, General considerations, and 5.2.1.1.2, Potential for exposure, and has been clarified by related language added at promulgation in sections 5.2.1.3, Targets, 5.2.1.3.2.1, Level I concentrations, and 5.2.1.3.2.2, Level II concentrations.* *The commenter may have misinterpreted this language in the preamble to the proposed HRS SsI Addition to equate the absence of an observed exposure as "no possible SsI intrusion route." The lack of a documented observed exposure based on indoor air samples collected during the SI (typically a short timeframe of 1-2 days) within a structure located above an ASC does not indicate that there is no possible SsI route into the structure (or that the containment factor value is zero). It only indicates there was no observed vapor intrusion identified during the sampling time period. However, a structure located above an ASC may have experienced vapor intrusion at other times aside from when the indoor air sampling was conducted, or could experience vapor intrusion in the future, given the temporal and spatial variability of vapor intrusion. Therefore, the target populations associated with structures in an ASC are not inherently restricted from scoring by the lack of an observed exposure.*

Comment	Response
Comment 6 – High Bias for Inferred Contamination The Preamble to the proposed rule explains that occupants of occupied structures within an ASC can be included as targets in cases where existing data indicate there are no documented observed exposures in the ASC. Considering these populations as potential targets could create a high bias of the ASC value, as these populations are in fact not exposed. This approach appears to conflict with other pathways where existing data that documents no observed releases prevents a reviewer from inferring contamination.	*Structures physically in the boundaries of an ASC, and the populations associated with those structures need not be considered part of the ASC if available information indicates otherwise. The language in the HRS SsI component at proposal, section 5.2.0, General considerations, includes the qualifier "unless available information indicates otherwise" when inferring structures to be within an ASC. Section 5.2.0 at promulgation states "[i]f sufficient data is available and state of the science shows there is no unacceptable risk due to subsurface intrusion into a regularly occupied structure located within an area of subsurface contamination, that structure can be excluded from the area of subsurface contamination." For example, a building with a structure containment factor value of zero (see HRS Table 5-12), such as a structure raised six feet above the ground surface, represents information indicating that intrusion of contaminated vapors is not likely to occur.* *Due to the time and resource limitations inherent to the Superfund site inspection process and the variability in subsurface intrusion rates with time, it is unlikely and impractical to expect that all occupied structures in which subsurface intrusion is occurring would be identified during a site inspection sampling event. Therefore, as noted, the HRS SsI Addition includes in the targets factor category evaluation those populations within an ASC, which are areas where subsurface sample contamination has been documented at levels meeting observed release criteria. By inferring contamination in an ASC between sampling locations, it is not assumed that all populations within the area are equally exposed to contamination from the subsurface. Instead, inferring contamination allows sites with large populations within an area of subsurface contamination to be ranked higher than sites with smaller populations in an area of subsurface contamination.* *EPA notes that HRS observed release criteria requires that the levels of contamination in the samples are significantly above background levels and that some portion of that increase can be attributed to the site being evaluated. The ASC is included in the HRS evaluation because this method will allow for an area with existing subsurface contamination below structures to be evaluated for the probable intrusion of the contamination into the overlying structures.* *Regarding the commenter's assertion that this approach "appears to conflict with other pathways where existing data that documents no observed releases prevents a reviewer from inferring contamination," that is not the case. For example, a single soil sample from a residential yard not meeting observed exposure criteria may not be considered sufficient evidence to document that contamination is not present in other parts of the yard. Other factors, such as the mode of deposition of the contamination, and the density of the samples meeting observed contamination in the area around the yard are possible factors to consider in making such a decision. Additional examples of similar contamination inference approaches in other pathways include: the inference of contamination in identifying an area of observed contamination in the 1990 HRS soil exposure pathway (and the now-promulgated soil exposure component); in the surface water migration pathway, there is in effect an inference of contamination for the purpose of determining which targets are subject to actual contamination between the probable point of entry and the most distant downstream observed release sample; and, in the air migration pathway, there is again an effective inference of contamination in considering targets subject to actual contamination in distance categories within the most distant observed release location.*
Comment 7 –Collection of Indoor Air Data to Eliminate Targets Given the concerns outlined in Comments 4 and 5, EPA should clarify whether occupants of a building that is located within an ASC can be eliminated as potential targets if the indoor air sampling data demonstrates that there are no observed exposures.	*In and of itself, the lack of documentation of observed exposure for a structure above an ASC does not eliminate targets associated with that structure from scoring. As noted in earlier responses, the lack of a documented observed exposure based on indoor air samples collected during the limited time period of a screening site investigation within a structure located above an ASC only indicates there was no observed vapor intrusion identified during the sampling time period. However, a structure located above an ASC may have experienced vapor intrusion at other times aside from when the indoor air sampling was conducted, or could experience vapor intrusion in the future, based on the temporal and spatial variability of vapor intrusion.* *Section 5.2.1.3.2.3 of the HRS SsI component at proposal, Population within area(s) of subsurface contamination, states that "[i]f sufficient structure-specific concentration data is available and state of the science shows there is no unacceptable risk of exposure to populations in a regularly occupied structure in an area of subsurface contamination, those populations are not included in the evaluation."*
Comment 8 – Expansion of Other Pathways to Define ASC Although the Preamble to the proposed rule explains that the Soil Exposure Component and the newly proposed SsI component are independent (additive) under the soil exposure and SsI pathway, the TCEQ is concerned that the establishment of the ASC(s) depend on, and thus compel, the expansion of soil, groundwater, and air data collection in order to ascertain ASC boundaries, even if these migration pathways are not expected to	*The commenters may be overestimating the data needs of the SsI component and how the HRS is used to identify sites for the NPL. First, the SsI component does not require all types of samples (e.g., ground water, soil, soil vapor, subslab, and indoor air) to be collected at every site, nor does it specify any specific sampling media be collected. The SsI component has been designed to use data from all sample media if available, although EPA acknowledges indoor air samples would likely be collected during an SsI site inspection from structures thought to be likely candidates to have significant indoor contamination levels based on available information. Indoor air samples are the only type of sample that can be used to establish*

Comment	Response
significantly contribute to the site score.	*observed exposure by chemical analysis to subsurface intrusion. Second, the number of samples required to demonstrate that a site qualifies for the NPL using the SsI component will depend on site-specific conditions, such as the lateral and horizontal dimensions of the subsurface contamination, the type of samples collected, and the density of receptors associated with each target (e.g., regularly occupied structures). Therefore, the SsI Addition will not necessarily compel the expansion of soil, groundwater, and air data collection to ascertain ASC boundaries beyond the number needed to delineate comparable size areas of contamination in the soil exposure component of the HRS.* *Furthermore, it is not a requirement to score every HRS pathway at a site if the site score based on one or more other HRS pathways or components is already above 28.50, the score that qualifies the site for placement on the NPL. EPA notes that other pathways can be scored if it is appropriate to inform the public of the threat posed by the unscored pathway.*
Comment 9 – Level of Effort for Typical PA/SI In general, it appears that the level of effort required to score a site for the SsI component is greater than the typical level of effort required to score all of the other existing HRS components. The proposed rule is focused heavily on an Area of Observed Exposure (AOE) and an ASC at each site. The information needed to verify that an area is an AOE (which includes indoor air sampling and background indoor air sampling), and the information needed to delineate an ASC (which likely includes groundwater sampling and/or soil vapor sampling) are both resource intensive endeavors that are beyond the scope of a typical PA/SI effort. The practicality of collecting this additional information on each site needs to be addressed, preferably in guidance that is concurrent with the proposed rule.	*Given the variable nature of vapor intrusion it is possible additional sampling and different types of samples beyond that of an SI performed for evaluating sites using other parts of the HRS may be required for the HRS SsI component. However, an SsI component evaluation is still designed to be used with relatively limited data; the sampling required to evaluate a site using the HRS SsI component is similar to that required for evaluating sites using other HRS pathways and components and is within the scope of a screening assessment. Furthermore, as is the case with the other HRS pathways, the level of effort required to evaluate a site already varies on a site-by-site basis depending on the size and extent of contamination at the site and the HRS pathways being evaluated. Therefore, it cannot be predicted with certainty that there will be an overall increase in cost or level of effort for any particular site due to the HRS SsI Addition.* *Regarding guidance, implementation of the SsI component and data collection for its scoring are possible topics for any future guidance, as such procedures may involve consideration of site-specific conditions, or topics of ongoing research and development.*
Comment 10 – Training States, such as Texas, that are performing preliminary assessments and site inspections on behalf of the EPA will require training on how to implement the proposed rule and conduct the sampling that is described. Quality assurance training will also be required for evaluating analytical sampling methods and data collected specifically for the SsI pathway. It is unclear as to when or how EPA intends to provide this training to the states.	*This comment concerns actions outside the scope of and not relevant to this rulemaking. The subject of this rulemaking addition of the proposed HRS SsI component to the HRS, whose purpose is to add to the HRS a scoring mechanism to the HRS for evaluation of SsI threats. Following promulgation, EPA will consider the need for any future guidance, training, and other information tools to support implementation of the HRS SsI component. EPA notes that it will likely examine existing procedures used by states in developing these materials.*
Comment 11 – Carcinogenic Risk Level The rule proposes to use a carcinogenic risk level of 1 in 1 million (1x10-6) for screening purposes, which is consistent with other components in the HRS process. Due to the uncertainty and variability associated with the SsI pathway, and bearing in mind EPA's acceptable cancer risk range, EPA may want to consider a carcinogenic risk level of 1 in 100,000 (1x10-5) for screening purposes, which is the logarithmic center of the acceptable cancer risk range. The purpose of the proposed rule is to allow an HRS evaluation to directly consider human exposure to hazardous substances, pollutants, or contaminants that enter regularly occupied structures through SsI in assessing a site's relative risk. Using a carcinogenic risk level of 1x10-5 would meet the purpose of the rule. A 1x10-5 risk level would also be more useful in terms of screening, especially in terms of screening sites out that are the least likely to present an unacceptable risk.	*EPA considers the risk level of one in a million (1×10^{-6}) to be appropriate for a screening tool, and it is consistent with CERCLA's directions and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The 1×10^{-6} screening risk level questioned by the commenter is used throughout the HRS because the level is the lower end of the individual lifetime cancer risk range identified in the NCP. EPA considers that the variability and uncertainty pointed to by the commenter are reasons to maintain this risk level to be protective of public health That is, the actual risk posed by a site may actually be greater than that implied by the site data available at the NPL listing stage.* *Regarding the commenter's concern the 1×10^{-6} screening risk level will not appropriately screen out sites least likely to present an unacceptable risk, this HRS SsI Addition does not impact EPA's policy or process of site prioritization. EPA considers the 1×10^{-6} screening risk level appropriate to safeguard public health.* *EPA notes that use of this risk level in the HRS does not mean that it is a cleanup level; the risk level acceptable at a specific site is determined after a remedial investigation, a site-specific risk assessment is performed and remedy decisions are made.*
Comment 12 – Inconsistencies with the 2015 EPA Vapor Intrusion Guidance There are several inconsistencies between the 2015 EPA vapor intrusion guidance document (*OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air*) and the proposed rule. Although some are explained in the technical support document that accompanies the proposed rule, others are not and this could lead to confusion for states who will ultimately use the proposed rule to score sites under the HRS process. The following are just a few examples related to this issue.	*The method for prioritizing sites using the SsI component for placement on the NPL is not inconsistent with the EPA guidance document (the June 2015 EPA document, OSWER Technical Guide For Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources To Indoor Air), as the SsI component and this guide serve different purposes and apply at different stages of the Superfund process when the level of site-specific information is considerably different. (Decisions discussed in guidance might not be made during an HRS investigation because the information necessary to support the decision may not be available.) The VI Guide and HRS SsI rule work in concert to establish national consistency in the evaluation of SsI threats. The HRS SsI Addition and this guidance document both address the threat posed by vapor intrusion and are based on the same scientific principles. However, the HRS SsI Addition and the guidance document serve different purposes, support different phases of the Superfund remedial process and the decision criteria in each were not designed to be nor do they need to be consistent in all aspects.*

Comment	Response
	The purpose of this guidance document is to guide the investigation, assessment of the threat and the need for remediation posed by vapor intrusion into structures from all sources under all OSWER (currently Office of Land and Emergency Management, OLEM) programs—particularly actions taken under CERCLA and RCRA. The HRS is used to prioritize sites for further investigation to determine the need for response actions under CERCLA; and, the HRS SsI Addition is an amendment to the NCP, under CERCLA to allow placements of sites on the NPL based on the threat individually posed by subsurface intrusion or in combination with other contaminant migration and exposure routes. Placement of a site on the NPL is a required step for further investigation and remedial actions to take place at these sites under CERCLA. The HRS SsI Addition is not guidance and uses data collected from a screening level investigation to rank the relative threat posed by sites. The SsI Addition does not address such subjects as data collection and sampling procedures; the guidelines in the VI guidance document are applicable for those purposes.
12a – Background Indoor Air Concentrations Although the approach for determining whether an indoor air concentration is above background is consistent with approaches described to determine background in other components of the HRS scoring system, it goes beyond and is more detailed than any description of how to determine background under the EPA vapor intrusion guidance document. There will be difficulty in selecting background locations for indoor air, ensuring they are free of other indoor sources or significant outdoor ambient sources, and determining how to sample (number of structures to sample, number of locations within a structure, number of samples to collect to discern seasonal fluctuations). This issue is a concern in terms of level of effort and defensibility.	*Because background indoor air levels are likely to vary significantly depending on site-specific conditions, EPA considers the establishment of appropriate background levels for purposes of evaluating sites using the HRS SsI component an appropriate topic for inclusion in any future guidance. EPA notes that for HRS purposes, background levels are mainly used to determine if there has been a significant increase in indoor contaminant levels. A separate but related step, that of establishing attribution involves projecting if the increase is due to indoor anthropogenic sources or outdoor ambient sources; it is likely that multiple lines of evidence will be required to establish attribution for the SsI component. EPA considers many of the sampling methods and procedures identified in the EPA VI guidance document will also be useful in establishing both background levels and establishing attribution.*
12b – Structure Containment The proposed rule provides a greater number of options in looking at building- or structure- specific factors in determining the potential for SsI of vapors by allowing scores to vary depending on the type of building and the way it is constructed. This was not specifically contemplated in the EPA vapor intrusion guidance. This is a welcome addition to the evaluation of SsI as it allows site-specific building parameters to be used in scoring for vapor intrusion; however, it becomes problematic and less useful when trying to evaluate a plume that underlies multiple structure types.	*EPA notes that EPA's VI guidance and the HRS SsI Addition work in concert to establish national consistency in the evaluation of SsI threats. The HRS SsI Addition and the guidance document both address the threat posed by vapor intrusion and are based on the same scientific principles. However, as explained in the previous response, the HRS SsI Addition and the guidance document serve different purposes and support different phases of the Superfund remedial process when the level of site-specific information is considerably different. Therefore, the decision criteria in each were not designed to be nor do they need to be consistent in all aspects. EPA agrees with the commenter's statement that because of the greater number of building characteristics that could impact an HRS structure containment factor selection, for a site including subsurface contamination that underlies multiple structure types, the HRS SsI component evaluation may be more complex than an evaluation for a simpler site.* *EPA notes that at promulgation the HRS SsI component Section 5.2.1.1.2.1, Structure containment, includes that for regularly occupied structures with unknown containment features, a structure containment value of greater than zero is assigned for the purposes of evaluating targets. (As mentioned in the preamble to the HRS SsI Addition at promulgation, section IV.A.4, Modifications Made to Section 5.2.1.1.2.1, Structure containment and Table 5-12, the containment value for a structure with a containment factor value of greater than zero based on unknown containment features cannot be used in assigning a potential for exposure factor.)* *EPA also notes that it is not possible to address all site-specific situations in the SsI component. This topic would be more appropriately addressed in any future implementation guidance following promulgation.*

Comment	Response
12c – Attenuation Factors/Depth Below Building Foundation The proposed rule specifies a depth of 150 feet below a building foundation as the depth at which SsI no longer appears to be an issue, except in the presence of preferential pathways or certain geological subsurface conditions, like karst. This is a departure from the EPA vapor intrusion guidance document which looks at depths to 100 feet below a building foundation. The proposed rule also provides relative scores that vary with depth ranges between 10 and 150 feet below a building foundation, which is not contemplated in the EPA vapor intrusion guidance.	*The differences in depth to contamination that the commenter noted between EPA's VI guidance and the SsI Addition do not represent an inconsistency because the documents are used for different purposes at different stages of the Superfund process. While depth/contamination concentration profiles may be available when determining if a site needs remediation as assumed in the VI guidance, at the HRS evaluation stage this level of information is not available.* *EPA's VI guidance and the HRS SsI Addition work in concert to establish national consistency in the evaluation of SsI threats. The HRS SsI Addition and the guidance document both address the threat posed by vapor intrusion and are based on the same scientific principles. However, the HRS SsI Addition and VI guidance serve different purposes and support different phases of the Superfund remedial process and the decision criteria in each were not designed to be nor do they need to be consistent in all aspects.* *The purpose of this guidance document is to guide the investigation and assessment of the threat posed by vapor intrusion into structures from all sources under all OLEM programs—particularly actions taken under CERCLA and RCRA. The HRS is used to prioritize sites for further investigation to determine the need for response actions under CERCLA; and, the HRS SsI Addition is an amendment to the NCP, under CERCLA to allow placements of sites on the NPL based on the threat individually posed by subsurface intrusion (both contaminated groundwater and vapor intrusion) or in combination with other contaminant migration and exposure routes. Placement of a site on the NPL is a required step for further investigation and remedial actions to take place at these sites under CERCLA. The HRS SsI Addition is not guidance and uses data collected from a screening level investigation to rank the relative threat posed by sites. The SsI Addition does not address such subjects as data collection and sampling procedures: the guidelines in the guidance document are applicable for these purposes.* *Although the maximum depth considered as a cutoff depth for HRS Table 5-13 in the SsI Addition differs from that in EPA VI guidance, the SsI Addition and the guidance document are based on the same scientific principles (e.g., the widely accepted Johnson and Ettinger [J&E] model). EPA provides its rationale for the 150-foot maximum depth in the SsI Addition in the Technical Support Document accompanying the HRS SsI Addition at proposal; this rationale is unchanged at promulgation. Page 55 of the Technical Support Document explains that "[a]s part of EPA's sensitivity analysis in developing route characteristics, it was determined that at depths of 150 feet or greater the attenuation factor did not change significantly. Therefore, the potential for exposure correspondingly did not significantly change with depths greater than 150 feet. As a result, the maximum depth considered in Table 5-13 of the proposed HRS addition was selected to be 150 feet." The sensitivity analysis referred to is further detailed on pages 53 and 54 of the TSD.* *Additionally, at the stage an HRS evaluation is typically performed following an SI there is insufficient data available to yield a site-specific profile of contamination vs. depth (in some instances there may only be ground water data). It is possible that yet-to-be detected contamination exists at shallower locations than those known via SI data. This is further indication that it is reasonable to set the maximum depth considered for HRS purposes lower than that for a site where a greater level of site-specific sampling results are available.* *Furthermore, sites are known to exist where the depth to contaminated ground water exceeds 150 feet and where underlying karst features that may act as preferential pathways are present to depths of 150 feet or greater (e.g., in the San Antonio, Texas area).Therefore situations do exist at sites where depths to contamination of 150 feet or greater may pose an SsI threat.*
EPA should provide a more thorough justification for the scores associated with these ranges and whether the ranges are applicable in situations other than for scoring of HRS sites.	*Regarding the comment that EPA should provide a more thorough justification for the scores associated with the Table 5-13 ranges, as explained above and in the TSD, at depths beyond 150 feet the effect of depth on attenuation becomes less significant in projecting subsurface intrusion, and therefore the maximum depth considered in Table 5-13 of the proposed HRS addition was selected to be 150 feet. The depth to contamination factor values range from zero to 10, where increasing depth results in a lower factor value (as explained on page 55 of the TSD). The ends of factor value range were set at the ends of the depth range—a factor of zero at a depth of 150 feet, and a factor of 10 starting at zero feet. The several factor value points between zero and 10 offered in HRS Table 5-13 were evenly distributed over the depth span from zero feet to 150 feet, generally following the logarithmic curve pattern exhibited by the plot of attenuation factors vs. depth shown in Figure 4-7 of the TSD.* *Regarding the commenter's question whether the Table 5-13 ranges are applicable in situations other than for scoring of HRS site; that is outside the scope of this rulemaking. However, EPA notes that the HRS purpose is quite specific and these ranges are only intended to be applied for the purpose of an HRS evaluation.*

Submitter: 0089 - Lenny Siegel, Center for Public Environmental Oversight (CPEO)

Public Submission Posted: 04/21/2016

ID: EPA-HQ-SFUND-2010-1086-0089

Comment	Response
I am writing to support EPA's proposed rule to add the vapor intrusion pathway as a component of the Hazard Ranking System (HRS) for listing properties on the "Superfund" National Priorities List (NPL). At many sites, state regulators do not have the experience, tools, resources, authorities, or will to properly investigate and respond to vapor intrusion. For example, at the Triple Site, in Sunnyvale, California, EPA Region 9 was asked by the Regional Water Quality Control Board to take over the vapor intrusion investigation, because it was having difficulties getting responsible parties to comply with state-of-the-art requirements. Under U.S. EPA lead, the investigation has confirmed vapor intrusion at homes and schools, and mitigation is being implemented. Because this site was already on the NPL, EPA was in a position to act.	*EPA has added the SsI component to the HRS. EPA acknowledges the commenter's support for the HRS Subsurface Intrusion (SsI) Addition.*
But at University Terrace, in Palo Alto, California, Stanford University is building housing on property with high levels of TCE in soil gas. But no remediation is taking place and standard mitigation strategies are not been carried out. The site is being addressed under the Voluntary Cleanup Program of the Department of Toxic Substances Control. I believe more a more protective response would be required if University Terrace had U.S. EPA oversight. If the proposed rule were in place, it would at least be subject to ranking under the HRS, and it possibly would be listed.	*Adding the SsI component to the HRS does not change the basic concepts, procedures and processes EPA currently uses for selecting which sites are candidate sites for evaluation for placement on the NPL (except to include in the process consideration of sites with sufficient possible SsI issues to indicate the site might qualify for the NPL when including an SsI evaluation in the HRS score.)*
I believe the proposed scoring system will work well for sites that obviously qualify or obviously do not qualify for the NPL based on the vapor intrusion pathway alone. It's difficult, however, to know how well the scoring system will work for sites in the middle of the risk continuum. I urge EPA to monitor how well scoring works in the first year or two, so it might consider adjustments if necessary.	*EPA agrees with the commenter's statement that for sites where it is obvious that a significant SsI threat does or does not exist, the HRS SsI Addition's scoring methodologies would appropriately determine a site's eligibility for placement on the NPL.* *EPA considers an SsI component will identify sites for placement on the NPL that are in the "middle of the risk continuum" in an equivalent manner as evaluations using other pathways and components of the HRS. Sufficient testing has been conducted during development of the HRS SsI Addition to ensure that an SsI site's relative risk would be comparable among sites evaluated using the other pathways and components. As discussed in Section III.6.C, Testing the SsI Component, of the preamble to the final HRS SsI Addition, the SsI component was tested extensively throughout the development of the SsI component. This testing ensured that the SsI component did not alter the relative contribution to the HRS site score provided by all HRS pathways and components, ensured that the level of relative risk (e.g., number of targets subject to actual contamination needed to achieve a site score of 28.50 or greater) necessary to qualify a site for placement on the NPL remained consistent across pathways. As part of this testing, extensive sensitivity analyses were performed on the SsI component to test the rule and identify and assign the relative magnitude of the factors having the greatest impact on the HRS site score. (Please see Appendix A: Conceptual Site Model/Sensitivity Analysis of the TSD for the final rulemaking for additional information on this topic.)* *EPA plans to monitor the implementation of the SsI component to identify its effectiveness and changes needed, if any.*

Submitter: 0090 - Daniel Norris

Public Submission Posted: 04/27/2016

ID: EPA-HQ-SFUND-2010-1086-0090

Comment	Response
I am writing as a private citizen in support of including a subsurface intrusion component in the hazard ranking system when evaluating the potential risk posed by a candidate superfund site. Vapor intrusion is a well established phenomenon and, at some hazardous waste sites, vapor intrusion poses the most significant exposure pathway. As EPA points out in the proposed rule, the potential for contaminated groundwater to enter structures also poses serious risks that are unaccounted for under the current hazard ranking system. Inclusion of subsurface intrusion during hazard ranking system scoring is long overdue. Indoor air exposure toxicity data exists for many of the chemicals found at superfund sites, analytical methods are generally capable of measuring these contaminants at or below the exposure benchmarks, and with aging structures and a growing population that is beginning to significantly redevelop on/near former industrial areas, the number of people at risk for subsurface intrusion only continues to increase.	*EPA has added the SsI component to the HRS. EPA acknowledges the commenter's support for the HRS SsI Addition. EPA has considered the suggestions provided by the commenter and its responses are presented below.*
Assessments of vapor intrusion should take into account ambient air background concentrations and contributions to indoor air concentrations from non-site related indoor air sources. Staff tasked with performing such assessments should be adequately trained on how to reliably collect samples to determine whether vapor intrusion poses an unacceptable risk. Laboratories used to analyze air and soil gas concentrations should be capable of providing reliable results at detection limits capable of comparing against relevant health-based benchmarks.	*The SsI component requires consideration of background levels in all evaluations that identify actual subsurface intrusion into regularly occupied structures. A consideration of other possible contributing sources to indoor air contamination is also required for an evaluation of attribution, which requires linking at least a part of the increase in concentrations of hazardous substances at a site to subsurface intrusion. Both of these requirements would encompass consideration of ambient hazardous substance levels.* *Regarding staff training and laboratory analytics, these comments concern actions outside the scope of, and not relevant to, this rulemaking. This rulemaking deals only with the addition of the proposed HRS SsI component to the HRS. However, EPA agrees that procedures for collecting the information necessary to perform an SsI evaluation, including for establishing background levels and for identifying the origin of indoor contamination, are appropriate topics for any future guidance and training. A key component of such training and guidance is the discussion of data usability and data quality objectives.*
While I am supportive of EPA considering the subsurface intrusion pathway, I believe that the process laid out in the proposed rule involves calculations that are far more complicated than necessary for prioritizing subsurface intrusion evaluations. As a result, it appears that significant resources would be tied up in conducting these complex calculations. These are resources that could otherwise be better directed by using professional judgment and empirical sampling data to determine whether subsurface intrusion is posing unacceptable risks. For example, EPA could use historic sampling data, coupled with field instruments (flame ionization detectors, photoionization detectors, x-ray fluorescence meters), to begin conducting a rough initial assessment of high-hazard sites. Although these field methods are not as reliable as lab analytical methods, they could be used to identify sites/buildings that contain gross levels of contaminants. In my opinion, such efforts to gather empirical data would go much further to serving the public interest and protecting the public, than paying staff to go through a rigorous bureaucratic calculation would.	*Regarding the complexity of the HRS SsI Addition, EPA considers that it has struck a reasonable balance between basing the HRS SsI Addition on site-specific data and requirements and the concept of the HRS as a screening tool to identify sites that pose sufficient threat to warrant further investigation. No commenter has suggested a more simplistic system that could use screening level data and still meet the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requirement in Superfund Amendments and Reauthorization Act (SARA) 105(c)(1) for the HRS to "the maximum extent feasible …that the hazard ranking system accurately access the relative degree of risk to human health and the environment posed by sites and facilities subject to review." While this commenter has indicated the HRS SsI Addition is too complex, other commenters have asserted that the HRS SsI Addition is not sufficiently accurate and should require more detailed information and site-specific modelling. Therefore, it appears that a reasonable balance has been struck. Furthermore, EPA does not agree significant resources will be tied up in conducting the calculations associated with scoring the SsI component because the calculations only require understanding of basic math to perform.* *Regarding the use of professional judgment and empirical sampling data in lieu of evaluating an HRS score for a site using data-based procedures, the commenter may misunderstand the purpose of the HRS. Because placing a site on the NPL is a rulemaking process, as required by CERCLA, all scoring and decisions are subject to public notice and comment and must be sufficiently documented to withstand legal challenge under the Administrative Procedure Act.* *The HRS score is an evaluation of relative risk based on a time and scope limited site assessment. If the site score is high enough the site is eligible for placement on the NPL. Placement on the NPL identifies that the site poses sufficient threat to warrant further investigation based on data gathered from the limited site assessment. Following placement on the NPL, a site may undergo a remedial investigation, which is a much more thorough and comprehensive evaluation of site-specific risk and is used to determine appropriate response action. While the HRS is a scoring tool and does not dictate or require any specific*

Comment	Response
	methods of data collection, EPA expects professional judgment will always be used in performing any data collection for HRS purposes, as well as the HRS evaluation itself. EPA notes that the commenter's suggestions for the use of field measurements, these types of measurements are often used during an SI to help identify or to supplement locations for the collection of samples for laboratory analysis and thereby reduce the number of samples necessary. Furthermore, the established guideline on data quality for use in all HRS evaluations is for the data to be of known and documented quality to show the HRS scoring is sufficiently accurate; if results of methods achieve this standard, the results can be used in performing an HRS evaluation as long as the data quality objectives are met.
Issues such as the water crisis in Flint, Michigan highlight the need for governmental agencies at all levels to work openly, in the public interest of the citizens as a whole, and in support of what is scientifically valid, rather than in the interest of only those with political power. Therefore, I urge EPA to consider subsurface intrusion issues at all sites within its legal authority. I am against any exemptions of such rules for specific industries, Department of Defense (DoD) sites, underground petroleum storage tanks (USTs), etc. Such exemptions only serve to diminish the credibility of public agencies in the eyes of the public.	*EPA has added the SsI component to the HRS. EPA will evaluate the need to include consideration of subsurface intrusion using the same procedures it presently uses to determine the need to include in the HRS evaluation consideration of all HRS pathways and components. Regarding exemptions, this subject is not within the scope of this rulemaking.*
Finally, I believe that acute risks, such as methane, should be factored in to vapor intrusion assessments. If EPA is to consider risk at the 1x10-4 to 1x10-6 risk level, then it should certainly be considering acute risk from issues such as significant degradation of organics that are capable of producing explosive levels of methane. Thank you for considering my comments on this proposed rule.	*Although the HRS assessment process is part of the CERCLA remedial program, an HRS evaluation reflects all risk, acute or chronic, posed by a site. EPA notes that, if during a site inspection, acute risks or potential for explosive hazards are identified, EPA would exercise its removal authority to respond to these risks, notifying the appropriate local or state authorities, and response actions would not be delayed until the Superfund remedial program evaluation is completed.*

Submitter: 0091 - Rachel Farnum Consulting/Pompton Lakes Community Advisory Group (PLCAG)

Public Submission Posted: 04/27/2016

ID: EPA-HQ-SFUND-2010-1086-0091

Comment	Response
We would like to express support for the addition of subsurface intrusion to the current Hazard Ranking System (HRS) and also support EPA's position that it is appropriate to address the underlying cause of vapor intrusion through this addition to the HRS scoring process.	*EPA has added the SsI Component to the HRS. EPA acknowledges the commenter's support for the HRS SsI Addition.*
1. It is understood that it would be a costly effort to go back and reevaluate site scoring for all past sites that were excluded from the NPL. However, on page 10373 [the proposed rule in the Federal Register] it states that "This proposed regulatory change does not affect the status of sites currently on or proposed to be added to the NPL." If a site is in the process of being scored when this change is finalized, we strongly encourage EPA to consider this additional pathway in that scoring rather than only applying it to new sites proposed after the date when this rule becomes final. Otherwise, risks from this pathway could be overlooked.	*As for the decision to include a specific pathway evaluation in the HRS scoring of any site for the NPL, the decision to evaluate or re-evaluate a site using the SsI component will likely be made based on whether or not the SsI component score is likely to affect the listing decision. This is the same approach used when determining if new information could result in a significant change in an HRS site score. If a site is currently being evaluated for placement on the NPL (i.e., has not yet been proposed for listing) at the time of promulgation of this rulemaking, the assessment of the subsurface intrusion threat could be considered in evaluating that site for proposal to the NPL. However, if a site qualifies for the NPL based on an HRS evaluation of other HRS pathways, it may not include an SsI evaluation in the HRS scoring of the site. This does not mean that further investigation of the site following promulgation of the site to the NPL will not include an evaluation of the subsurface intrusion threat or consideration of the need for remedial action to address the threat.*
2. It could be misleading in some situations to have a higher score for an Area of Observed Exposure (AOE) compared to an Area of Subsurface Contamination (ASC) when the only real difference in these areas could be the lack of indoor air sampling completed in the ASC. The actual risk to residents could be exactly the same, but they simply haven't collected data in the ASC to confirm that yet. One reason this is a concern is that, if a responsible party knows that a site could score lower just because data have not been collected, they could intentionally delay collection of indoor air samples (by using the many excuses they are known for using to delay or avoid collecting data they don't want on record) to try to get a lower score. Though a site could be reevaluated in the future, this process takes time and residents could be exposed to unacceptable levels of contaminants during that time period.	*EPA ranks those sites with documented actual exposure higher on a relative risk scale than those with no documented exposure when utilizing the same screening level of data at all sites. The commenter may have misconceptions about the import of the magnitude of a site's HRS score in identifying sites for placement on the NPL, the process EPA uses, and the authority under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) EPA can use to collect the information necessary to perform an HRS evaluation. Regarding the magnitude of the HRS site score, an HRS site score of 28.50 qualifies a site for the NPL. Sites with scores greater than this cut off score are not necessarily prioritized above those with lower scores still above the cut off score for further investigation or for remedial action. EPA designs its sampling program to collect the same level of information at all sites to use in determining if the HRS site score will be above the cut off value of 28.50. If after a screening site assessment, the HRS site score is not 28.50 or greater, but there is appropriate reason to consider that further sampling would result in a higher HRS score, EPA may resample the site to collect the information. Thus, EPA will sample the indoor air in sufficient numbers of structures to determine if the HRS site score is likely to be at or above 28.50.* *EPA can also at any time in the site evaluation process sample a greater number of structures to determine if an imminent or substantial endangerment to public health exists, and will not delay this sampling for completion of the process for placement of a site on the NPL. Regarding the possibility that a potentially responsible party (PRP) might delay sampling of a site, EPA has ample authority under CERCLA to sample sites, even if a PRP attempts to delay such action; EPA can obtain court orders to perform the necessary sampling, particularly when there is reason to project that there is an endangerment of public health.* *The commenter also may not understand why populations within an AOE are weighted higher than those within an ASC. An ASC is weighted lower because there is no evidence documenting that an actual exposure to hazardous substances due to subsurface intrusion has occurred during a screening site evaluation. Specifically, the HRS SsI component score reflects that populations in regularly occupied structures within an AOE are demonstrated to be actually exposed to subsurface contamination. The SsI component evaluation reflects a lesser demonstrated threat to populations in regularly occupied structures where an observed exposure has not been documented (i.e., structures in an ASC). However, these populations in the ASC are considered to be probably exposed to subsurface contamination and the score assigned to them is higher than if they are not in an ASC (or AOE). This weighting approach consistent with other HRS pathways and components. This approach is also consistent with the Congressional mandate to emphasize sites with actual exposures to releases of hazardous substances and is consistent with how receptors actually or potentially exposed to contamination are considered in other HRS pathways and components.* *Furthermore, EPA notes that at any time in the site assessment process, if it can be determined that an acute threat may exist to human health, EPA can undertake a removal assessment. EPA will not delay addressing the risk until the HRS evaluation is completed.*

Comment	Response
3. Page 10387 [of the proposed rule in the Federal Register], section ii - the process used to select an appropriate background location is vague. The Proposal TSD says that several factors that influence indoor air will be considered in selecting background locations, but it is not clear in that document how these locations will be selected either. What if it is a tetrachloroethylene (PCE) site, for example, and residents in homes above the vapor plume do not dry clean clothing but residents in homes outside of that area (that are selected as "background") do? In this example, it would not be right to penalize people who do not routinely expose themselves to PCE simply because their neighbors outside the plume do. Further explanation of how this type of situation would be avoided should be provided.	*The HRS does not contain specific procedures for collection of the data necessary for performing an HRS evaluation, including that data needed to determine appropriate background levels. EPA considers this topic more appropriate for any future guidance. If specific procedures were placed in the HRS itself, it would require a rulemaking to revise the HRS regulation each time sampling technologies are developed or advanced.* *Specifically regarding indoor sources of solvents, such as PCE that may originate from dry cleaned clothing, it is currently EPA standard procedure to remove such anthropogenic sources prior to sampling air contaminant levels in structures. By removing indoor sources of contaminants of concern, the background level in the absence of subsurface intrusion contamination could be determined and used in documenting whether an observed exposure by chemical analysis has occurred in a regularly occupied structure. This action eliminates the possible influence of the use of anthropogenic sources of contaminants. Procedures for addressing variation in the possible uses of anthropogenic sources of hazardous substances as it relates to establishing background levels is a topic for any future guidance on the implementation of the HRS SsI component.*
4. Page 10390 [of the proposed rule in the Federal Register]. Will the depth to contamination account for the range of water table fluctuations throughout a year? It is understood that these investigations are completed over a short period of time. However, groundwater data from several years are available in some cases that could provide insight into these fluctuations. To be protective, the shallowest depth to water table should be used in site scoring where a range of values are available.	*Regarding consideration of fluctuations in the annual water table range in scoring the depth to contamination factor, EPA agrees that the height of the water table can vary during a year; however, because an HRS evaluation is based on data obtained from a limited time period screening assessment, it is not possible to determine the range of variation in the water table height at all sites that may be evaluated using the HRS. EPA notes that the actual "depth to contamination" factor value is assigned at a site is based on categories reflecting a range of depths. This accounts for a large extent for the variability in the height of the water table (see HRS Table 5-13, Depth to contamination). Further, if a shallower depth to contamination is measured at a later date, EPA can reevaluate the site using the HRS.* *Regarding consideration of the depth to contamination factor when multiple values are available, the HRS scoring uses the shallowest depth to contamination documented to be present in a contaminated crawl space or subsurface media sample, not just ground water such as soil or soil gas, to assign a factor value when evaluating the potential for exposure factor (see HRS Section 5.2.1.1.2.2, Depth to contamination). However, regarding the commenter's example where a range of values are available for the depth to the water table present, the SsI component would use the shallowest depth to an eligible contaminated crawl space or to a subsurface media sample to determine the Depth to Contamination factor evaluation.*
5. Table 5-12 of Proposed HRS addition: "Regularly occupied structure with unknown containment features" has score of 2, which is the same as structures that have an active mitigation system without deed restrictions and funding in place for O&M? How is a structure of which nothing is known about the containment considered the same as a structure with a mitigation system and scored only slightly higher than a structure with active mitigation that has deed restrictions and funding for O&M (which would score 0 instead of 2 on a scale as high as 10)? A more conservative approach should be taken to structures of which nothing is known about the containment system. An overall concern in reviewing this scoring system is that there are elements of the proposal (including this specific example) in which a responsible party could be "rewarded" with a lower score simply by not having data available for the scoring.	*HRS Section 5.2.1.1.2.1, Structure containment, and HRS Table 5-12, Structure Containment, have been revised at promulgation to remove from the table the instruction to assign a value of 2 to regularly occupied structures with unknown containment features. Instead, instructions have been inserted to the text in HRS Section 5.2.1.1.2.1 to "assign a structure containment value of greater than zero for the purposes of evaluating targets." This revision was made to help improve the continuity of HRS Table 5-12, which directs the assignment of values when containment features of the structure are known. A structure with a containment factor value of greater than zero cannot be used in assigning a potential for exposure factor value. EPA considers it appropriate that the potential for exposure factor value should be based on actual field observations.* *However, a regularly occupied structure with a structure containment value of greater than zero allows the structure to still be evaluated for assigning waste characteristics values (e.g., a hazardous waste quantity factor value) and for assigning target factor values. EPA considers the inclusion of structures with unknown containment features in the calculation of waste characteristics and targets values appropriate as it reflects that very few structures are built to be sufficiently air tight to prevent subsurface intrusion.* *As for the commenter's concern that the SsI component's structure containment evaluation could "reward" a responsible party with a lower score, the commenter appears to be under the impression that potentially responsible parties (PRPs) are responsible for developing the sampling plans and collecting the data to be used in performing an HRS evaluation. In most situations, EPA, its agents, or a State, design the sampling events and collect the data for performing an HRS evaluation. While in some situations, a PRP may collect data under a cooperative agreement or an agreement upon consent, EPA will review the sampling plan and sampling results to ensure the appropriate information is collected. Furthermore, if after a sampling event, EPA determines that further sampling is necessary to demonstrate that a site will or will not qualify for the NPL; EPA will perform a follow-up sampling event (often referred to as an expanded site inspection).* *Regarding the possibility that a PRP might delay sampling of a site, delay providing the information necessary to perform a complete HRS evaluation, or refuse access to the site, EPA has ample legal authority under CERCLA to sample sites. For example, EPA can obtain court orders to perform the necessary sampling, particularly when there is reason to project that there is an endangerment of public health.*

Comment	Response
6. Proposal TSD, page 59 - "Similar to the groundwater migration pathway, the top 10 feet is not considered when evaluating the vertical migration factor because the structure of the soil in this layer is typically impacted by human activities such as utility lines and by roots from vegetation that can result in channelized flow." Given that these "human activities" could affect vapor migration, they should be included in the vertical migration factor. The significant difference between vapor migration and groundwater migration in this aspect of the scoring system should be accounted for given that the shallow soils are the soils coming into contact with the homes.	*The commenter may misinterpret the HRS SsI component's consideration of the top 10 feet of soil in scoring the vertical migration factor. The magnitude of the assigned factor value only increases with greater thickness of the subsurface layers. The SsI component evaluation reflects the potential impact on vapor migration in the subsurface environment due to such preferential pathways. Excluding the top ten feet of soil in scoring the vertical migration factor represents the concept that this interval is unlikely to have any significant effects on degradation of a hazardous substance as it migrates vertically.* *This consideration is based on the consideration that the subsurface soil in the top 10 feet is typically impacted by preferential pathways resulting from human activities (e.g., presence of utility lines) and roots from vegetation.*
7. Proposal TSD, page 70 - it states that horizontal migration is not considered because the proposed addition will only consider current conditions. However, what if horizontal migration is currently occurring due to preferential pathways? Where is the requirement to consider that in this evaluation? Vapors do not migrate in only one direction and movement in the subsurface is difficult to predict, as the document states. However, that is all the more reason to include some allowance for horizontal migration to be protective of residents.	*If horizontal migration is occurring through preferential pathways, sampling can be used to document this situation and the area where contamination has spread will be considered as part of the site and included in the HRS evaluation. EPA agrees that subsurface vapor migration can occur horizontally in the subsurface due to preferential pathways. The SsI component evaluates two areas in which exposure to subsurface intrusion contamination exists or is likely to exist, the AOE and ASC. An AOE is delineated based on the location of occupied structures with documented contaminant intrusion from the subsurface (i.e., an observed exposure), while an ASC is delineated based on samples documenting the presence of subsurface contamination, but where either indoor air sampling has not documented an observed exposure or no sampling of indoor air has been undertaken. Furthermore, the HRS SsI Addition allows the inference of contamination between sampling locations in the AOE and ASC, unless available information indicates otherwise. Therefore, the horizontal migration of hazardous substances in the subsurface environment within an AOE or ASC will be considered in an HRS SsI evaluation.* *EPA considers that possibly placing sites on the NPL based on speculative predictions of future horizontal migration would be inappropriate based on the information available during a screening level assessment. The agency notes that to accurately determine the possible extent of horizontal migration through preferential pathways beyond the defined boundaries of AOEs and ASCs at all candidate sites is beyond the capability of existing levels of modeling, based on the level of information likely available or that could be collected during a screening level assessment.* *The decision to not include consideration of the potential migration of hazardous substances beyond the boundaries of an AOE or ASC does not restrict future investigations from expanding the site boundaries or preclude re-evaluating a site if further studies, or new information, indicates that the extent of contamination at a site may have increased due to migration.*
8. Proposal TSD, page 72 - we are concerned about using the proposed method to calculate the amount of chemical in a home based on the size of the structure. If two homes have the same indoor air concentrations, but one home is larger than the other, isn't the risk to individuals in both homes (assuming no sensitive populations) the same based on comparing to health-based concentrations? Why should a smaller home be weighted differently (e.g. lower) in this case if the occupants are exposed to the same indoor air concentrations? The justification for this should be explained further.	*The commenter may be misinterpreting the role of hazardous waste quantity in the HRS algorithm. If sufficient information is available to estimate with reasonable confidence the total mass of hazardous substances that have entered a structure by subsurface intrusion, this value will be used in the HRS evaluation.* *In addition, the hazardous waste quantity factor does not by itself reflect the dose an individual may be exposed to. EPA agrees that if the concentration in a large structure is the same as in a small structure, the dose the individuals receive would be the same if all other factors are equivalent. However, it is not likely that the contaminant concentration in a structure can be predicted with confidence based on a limited time, screening site assessment due to the temporal and spatial variability in vapor intrusion rates. Without performing long-term-site-specific monitoring studies equivalent to those performed during a remedial investigation, for purposes of performing a site-specific risk assessment, is unlikely to know with confidence the site-specific exposure levels at the time of an HRS evaluation.* *Additionally, the size of a structure is considered to be correlated to the amount of contamination that populations may come in contact with: the larger the structure the larger the number of individuals who may occupy the structure. Simply put, a large number of people are more likely to occupy a large structure and be exposed to contamination than in a small structure. Therefore, EPA considers contamination in a larger structure may pose a higher threat and a higher priority for further investigation than contamination in a small structure.* *EPA notes that the population factor value in the HRS algorithm, which is directly correlated with the number of occupants in regularly occupied structures at the site, enables further differentiation between sites.*

Submitter: 0092 - Wes McCall

Public Submission Posted: 05/02/2016

ID: EPA-HQ-SFUND-2010-1086-0092

Comment	Response
I believe it is important to proceed with the addition of the Subsurface Intrusion (SsI) component to the Hazard Ranking System to provide for adequate protection of human health and the environment. There are two (2) primary comments I would like to make for consideration.	*EPA has added the SsI component to the HRS. EPA acknowledges the commenter's support for the HRS SsI Addition. EPA has considered the suggestions provided by the commenter and its responses are presented below.*
1) Future Potential Migration & Exposure Under Section 5.2.1.1 of the Proposed HRS addition it indicates that future potential for migration and exposure are not to be included in the SsI Addition due to the complexity and cost of evaluating this factor. It references the "Johnson & Ettinger" model and the collection of the data (usually by multiple episodes of field investigation) that are required to adequately model and evaluate the potential for VOC migration and exposure. I believe there are clear and usually obvious conditions when significant data collection and modeling are not required to determine if there is significant potential for migration and human (or environmental) exposure due to SsI. There are some "high probability" migration pathways that can often be assessed with little or no field investigation and a modicum of standard site assessment background research. The first of these would be: a) Man-made migration pathways: These would include the well know and well documented underground utility trenches (e.g. gas lines, sewer lines, water lines, etc.) that transect almost all (potentially) contaminated sites. When such man-made migration pathways transect zones of free product contamination (LNAPL, DNAPL, etc.) in the vadose or saturated zone the potential for relatively rapid contaminant migration (vapors, gases, fluids) into structures and buildings at significant distance from the source area is significant. These pathways will lead to almost every occupied building in the site vicinity. Sometimes at significant distance from the site. b) Natural migration pathways: In some natural geologic settings (alluvial, glacial, karst, fractured rock, fault zones, etc.) there are naturally occurring pathways in both the vadose and saturated zones that could permit the rapid movement of contaminants (vapors, gases, fluids) into structures and buildings at significant distance from the source area. I propose that the Agency re-evaluate the "Future Potential Migration & Exposure" factor for the addition of the SsI component to the HRS and provide for consideration of such "high probability pathways" in the final rule.	*EPA agrees that the presence of both man-made and natural preferential pathways can result in rapid and widespread contaminant migration. However, to accurately determine if and when such migration pathways exist, and the extent of the migration through them into structures and not to the atmosphere would require a level of information well beyond what is expected to be available, or what could be collected, during a screening-level assessment at all sites being evaluated for placement on the NPL. The HRS is a screening tool that uses data from the SI, which is a screening level assessment. To only consider this at sites when data is available would bias the relative ranking among sites. Therefore, it is not appropriate to include a thorough evaluation of preferential pathways, and any related contaminant migration, in the HRS SsI Addition.* *EPA notes that the presence of man-made and natural preferential migration pathways are considered in the HRS SsI Addition in Sections 5.2.1.1.2.1, Structure containment, and 5.2.1.1.2.3, Vertical migration, respectively. EPA also notes that when information on these preferential pathways is known, screening level sampling can be performed to document if contamination is indeed migrating through the preferential pathways and the results can be used in the HRS evaluation.* *EPA agrees future subsurface vapor migration can occur via man-made and natural subsurface preferential pathways. However, to accurately determine if such migration pathways exist, and the extent of the migration through them, is beyond the capability of existing levels of modeling, and, in most cases, would require a level of information well beyond what might be available and what could be collected during a screening level investigation. The HRS is a screening tool that uses data from the SI, which is a screening level assessment. Furthermore, EPA notes that other commenters agreed that placing sites on the NPL based on speculative predictions of future migration would be inappropriate.*
2) Sensitive Environments Under Section 5.2.1.3 it is proposed that "sensitive environments" are not being considered as "eligible targets" within the SsI component because this deals only with intrusion into structures where such environments would not exist. I believe this is an over simplification or simply an oversight of the Agency. As an example ... There have been investigations performed by the Missouri DNR at landfill sites where methane gas has migrated off site and at high concentrations has killed plants and even trees of significant size. It is possible that some threatened or endangered plant species could be killed. While I do not know of any documentation in the Missouri DNR work about this, it is very probable that any endangered species living in the subsurface (voles, mice, insect larvae, etc.) would be negatively impacted if not killed by such vapor intrusion. I am confident that similar impacts (kills or die-offs) have occurred due to vapor plumes of other contaminants, whether documented or not. I propose that the Agency re-evaluate the "Sensitive Environments" factor for the addition of the SsI component to the HRS and provide for consideration of such environments in the final rule.	*The exclusion of consideration of "sensitive environments" from the HRS SsI Addition is not an oversight. The risk to sensitive environments, such as habitats of eligible endangered and protected populations of plants and animals, from subsurface vapors would be unlikely due to subsurface intrusion into an overlying regularly occupied structure (which is what the SsI component evaluates); therefore, a consideration of sensitive environments is not included in the HRS SsI Addition. It is possible hazardous substances within the subsurface could result in off-gassing into the atmosphere that effects sensitive environments, and this exposure route could be evaluated within the existing HRS soil exposure component or air migration pathways.*

Submitter: 0093 - Anonymous

Public Submission Posted: 05/02/2016

ID: EPA-HQ-SFUND-2010-1086-0093

Comment	Response
It is my understanding that in order for a site to score in the SsI pathway, eight homes with 3 people in each home (or something generally equivalent to this) will have to be impacted. Given the difficulties with site access to residences to collect the data, it seems that it would be next to impossible to have the necessary information at hand to be able to score a site, unless there is some alternative scoring strategy.	*EPA disagrees with the commenter's concern that it would be impractical for sufficient data to be collected to conduct an HRS subsurface intrusion (SsI) evaluation. During development of the HRS SsI Addition, EPA considered the type of information that could be collected during a time-limited site inspection (SI) when selecting the factors to include in an evaluation of the SsI component. EPA notes that the purpose of the SI (see NCP 300.420(c)) is to determine if a release of a hazardous substance poses an actual or potential threat to human health or the environment, to determine if there is an immediate threat to people or the environment, and to collect sufficient data to enable the site to be scored using the HRS. However, EPA acknowledges that in some cases the scope of a typical SI may need to be expanded (an expanded site inspection (ESI) performed) to collect the information necessary to evaluate the SsI threat present at a site. Furthermore, if there is evidence of a specific health concern at a structure EPA can gain access through a court order.* *Regarding the commenter's example scenario, roughly the same number of receptors needs to be threatened at the same levels for the SsI pathway than for the other HRS pathways for a site to qualify for the NPL. The specific number of structures and targets needed to achieve an NPL qualifying site score of 28.50 or greater varies significantly based on the other scoring factors (e.g., toxicity of a hazardous substance, the amount of hazardous waste present, the hazardous substance concentration in indoor air samples from a structure) included in an HRS evaluation. The HRS SsI Addition considers two areas in which exposure due to SsI contamination exists or is likely to exist: 1) areas of observed exposure (AOE)—areas in which contaminant intrusion into regularly occupied structures has been documented, and 2) areas of subsurface contamination (ASC)—areas in which subsurface contamination underlying regularly occupied structures (such as in shallow ground water or soil vapor) has been documented, but at which either sampling of indoor air has not documented that subsurface contamination has entered a regularly occupied structure or no sampling of indoor air was done. The HRS SsI Addition also allows the inference of the presence of contamination in an AOE or ASC between sampling locations. Therefore, an HRS SsI evaluation may not need to sample every regularly occupied structure at a site to perform an HRS evaluation. EPA notes that if HRS scoring required sampling every structure a sufficient number of times to assure that all exposed targets were accounted for, the scope of the sampling effort would be beyond that of a screening tool and more consistent with the scope of a complete evaluation of the site-specific risk for a site. Site-specific risk assessment occurs at a later stage of the Superfund process after a site has been placed on the NPL.* *For further information on the sensitivity analysis performed and the scoring scenarios developed to test the SsI component, please see Appendix A: Conceptual Site Modeling/Sensitivity Analysis of the final Technical Support Document (TSD) for the HRS SsI Addition. Furthermore, please see Appendix B: Site Summaries and Scoring Information for Test Sites (Tier 1) of the final TSD for a compilation of summaries describing the 11 test sites used to test the SsI component evaluation process. These test sites were not randomly chosen, but instead were specifically selected because they have documented subsurface intrusion threats and that it is feasible to obtain the necessary data for using the HRS SsI Addition.*

Submitter: 0094 - Charles Job, National Ground Water Association (NGWA)

Public Submission Posted: 05/03/2016

ID: EPA-HQ-SFUND-2010-1086-0094

Comment	Response
(1) Groundwater Modeling Not Useful in Scoring for Subsurface Intrusion. EPA considered including within the subsurface intrusion component an approach for incorporating populations subject to future migration (outside the Area of Subsurface Contamination or ASC) similar to that used for the ground water (GW) migration pathway. However, EPA's confidence in the present science to accurately project hazardous substance migration through both the ground water and the unsaturated zone is limited. Extensive sampling would be required. Given the limited amount of time and resources for HRS assessment for ranking purposes, it was determined not to add the Subsurface Intrusion (SsI) component to the GW pathway. NGWA agrees with the proposed rule for addressing subsurface intrusion to structures. NGWA does not agree that GW modeling is not sufficiently developed to allow projection of hazardous substance migration through groundwater and the unsaturated zone. NGWA asks that EPA reconsider this conclusion and its relation to the decisions the agency made as to using modeled results in scoring for contaminated sites in which subsurface intrusion is a component. If the agency decides to further evaluate the contribution of groundwater models, NGWA offers to assist in convening a discussion of subject matter experts on this subject.	*EPA has reconsidered its decision to not use ground water modelling to project the threat posed by subsurface intrusion into areas where subsurface contamination has not been documented, but has again decided to not incorporate the use of groundwater modeling to project this threat in such areas. EPA's decision is based on its considerable experience in groundwater contaminant transport modelling and the need for extensive site-specific information to develop and test the accuracy of such models. The information necessary to ensure the accuracy of such models is beyond that which can be collected in a screening site assessment, which is the basis for all HRS assessments. However EPA does consider that during further investigations of sites promulgated to the NPL at later stages of the Superfund process, it will likely be possible to collect the site-specific information necessary to develop models of sufficient accuracy for use in projecting future site conditions.*
(2) Subsurface Intrusion to be included in Soil Exposure Pathway. EPA proposes to include the Subsurface Intrusion (SsI) component in the Soil Exposure Pathway. NGWA agrees with the agency's structuring of the SsI component in the Soil Pathway while recognizing that groundwater may be the major factor in many contaminated sites that contain contamination being released to the soil and to structures to which volatile contaminating substances are migrating.	*EPA agrees that ground water contaminant transport will be a major mechanism for the migration of subsurface contamination to locations beneath regularly occupied structures and has included in the SsI component methods for considering the threat posed to occupants of such structures by contamination in groundwater migrating into such structures.*
(3) Categorization of Channelized Flow Features. EPA proposes special consideration of "Depth to Contamination" for subsurface profiles impacted by channelized flow features, such as fractured bedrock or karst. NGWA agrees that special consideration should be given to channelized flow features such as fractured bedrock or karst but that this factor should be evaluated, regardless of formation geology, under a new consideration called "Underground Contaminant Migration," rather than "Depth to Contamination." In the subsurface, groundwater and contaminant migration can be vertical or horizontal. In estimating potential targets impacted by SsI, horizontal migration may be a significant component. Migration in all directions should be considered. Inclusion of a new consideration of "Underground Contaminant Migration" may affect HRS scoring. NGWA also would propose that the discussion of groundwater modeling among subject matter experts be applied to this aspect of the proposed HRS changes.	*EPA reconsidered the use of ground water modelling to project future horizontal or vertical migration of contamination via ground water and the subsequent migration into regularly occupied structures. EPA concluded that the amount of site-specific information necessary to develop and test site-specific ground water models capable of performing such projections with reasonable confidence is beyond that which can be collected during a limited screening site assessment, which is the basis for HRS evaluations. However EPA does consider that during further investigations of sites promulgated to the NPL at later stages of the Superfund process, it will likely be possible to collect the site-specific information necessary to develop models of sufficient accuracy for use in projecting future site conditions.*

Submitter: 0095 – Denise Martin, Montana Department of Environmental Quality (MTDEQ)

Public Submission Posted: 05/03/2016

ID: EPA-HQ-SFUND-2010-1086-0095

Comment	Response
The Montana Department of Environmental Quality (DEQ) reviewed EPA's proposed update to the Hazard Ranking System Rule (HRS), outlined in the February 29, 2016, Federal Register. DEQ supports the addition of subsurface intrusion to the HRS. DEQ is addressing vapor intrusion at some contaminated sites under its state superfund or other program authorities; however, there are instances where DEQ is unable to identify a viable, liable party, and DEQ sometimes lacks the resources to adequately address the vapor intrusion issues. At some of these sites, vapor intrusion is the only risk to receptors because contamination is at depth and the receptors are not using contaminated groundwater as a drinking water source. Adding subsurface intrusion to the HRS will allow the use of federal resources to protect human health when warranted.	*EPA has promulgated the addition of the subsurface intrusion (SsI) component to the HRS. As noted by the Montana DEQ, this addition will allow federal funds to be used to further investigate priority sites with subsurface intrusion issues. If the investigations show that an unacceptable risk is occurring, Superfund authorities and funding will be available to address the risk.*
It would be helpful for EPA to clarify how subsurface intrusion can be evaluated for sites that are already on the National Priorities List (NPL). For example, DEQ would like to see subsurface intrusion added to 5-year reviews at sites with volatile organic compounds.	*Regarding consideration of subsurface intrusion at sites already on the NPL, how EPA addresses sites already on the NPL is outside the scope of this rulemaking, as the focus of this rulemaking is on evaluating sites for the NPL. However, it is an appropriate topic for any future guidance.*
EPA indicates that published background studies could be used to demonstrate background concentrations for scoring purposes. DEQ completed a study in 2012 that establishes Montana-specific background levels for residences - Typical Indoor Air Concentrations of Volatile Organic Compounds in Non-Smoking Montana Residences Not Impacted by Vapor Intrusion - that DEQ has used to evaluate vapor intrusion in Montana, and asks that EPA Region 8 use this data to assist with establishing background indoor air concentrations for sites in Montana.	*Procedures for establishing background levels of hazardous substances in occupied structures are not addressed in this rulemaking. EPA notes that in relation to establishing background levels for all HRS pathways, EPA's 1992 Interim Final Hazard Ranking System Guidance Manual does identify that area-wide background level studies are a source of information that can be used in establishing a site-specific background level. It is important, however, to consider if these area-wide values are representative of site-specific conditions.*
DEQ would like to point out that it does not use generic attenuation factors when evaluating vapor intrusion because, in its experience, there is such variability between site conditions and structures that only site-specific data can be reliably used to determine how much a specific compound attenuates from the subsurface into a structure. DEQ would prefer that generic attenuation factors not be used in scoring sites under the subsurface intrusion pathway. If EPA believes that the score needs to consider attenuation, then DEQ suggests that site-specific data be used and that the value that shows the least amount of attenuation be used in scoring the site because it will result in a more protective approach.	*EPA agrees that vapor intrusion attenuation factors, which project indoor contaminant levels based on subsurface concentrations, are extremely sensitive to site-specific conditions. For example, when the concentrations of the contaminant levels at a site are not known with reasonable confidence, such as when only a screening level sampling event has been performed (as would be the case during an HRS evaluation), use of attenuation factors to predict quantitative indoor air concentrations is not appropriate. EPA notes that while the concept of attenuation of contaminant concentrations as a vapor moves upward through the subsurface is reflected in the conceptual model used to develop the SsI component, no specific attenuation factors are integrated in a quantitative manner into the SsI component. However, EPA does consider attenuation factors can be used in designing appropriate sampling plans for collecting the data to be used in the HRS evaluation.*
EPA specifically requested input in three areas: 1. "Is there a way to determine the presence and extent of biologically active soil at a site during a limited site investigation? If so, what soil characteristics should EPA consider to determine whether biologically active soil is documented to be present?" EPA should consider whether the presence of biologically active soil can be determined by measuring oxygen, carbon dioxide, nitrogen, hydrogen, and methane in soil vapor samples. These fixed gases are generally used as multiple lines of evidence when evaluating vapor intrusion, but may also have limited use in determining extent of biologically active soil.	*EPA agrees that the measurement of gases indicative of biologically active soils can be indicators of the presence of biologically active soils. However, because the HRS is used to identify priority sites based on a time limited screening assessment, EPA considers it unlikely that sampling of these gases during a time limited screening assessment will identify with reasonable confidence, the presence of sufficient biologically active soils to effectively reduce the threat due to subsurface intrusion of hazardous substances. This is due to the temporal and spatial variation in gas levels that is likely to occur at sites resulting from variation in site-specific conditions, However, the agency agrees that such information can be appropriate to be collected when doing further, post-listing investigation of the site-specific threat posed at sites.*
[EPA specifically requested input in three areas:] 2. "How could EPA further take into account the differences in dilution and air exchange rates in large industrial buildings as compared to smaller residential and commercial structures when calculating the hazardous waste quantity for the HRS Subsurface Intrusion Addition?" In DEQ's experience, there is not a dependable way to account for the differences between large industrial buildings and smaller residential and commercial structures. The construction of these types of buildings vary greatly - even between two smaller commercial	*EPA agrees that it is beyond the scope of an HRS evaluation to require collection of site- specific information on dilution and air exchange rates in any size structure. EPA also agrees that this information may not be available for many structures and when available, may only be representative of limited time periods. However, EPA notes that if it is available, the HRS has a method for incorporating the information on dilution and air exchange rates into the calculation of a hazardous waste quantity factor for the structures, the factor that reflects the magnitude of the hazardous substance release to which an individual might become exposed. This is the Tier A method of estimating a pathway hazardous waste quantity factor value described in HRS Sections 2.4.2.1.1, Hazardous constituent quantity, and 5.2.1.2.2, Hazardous waste quantity. EPA notes*

Comment	Response
structures there can be completely different air exchange systems.	*that the HRS also provides for alternative ways of estimating the hazardous waste quantity when the information is not available to make a complete estimate of this quantity with reasonable confidence.*
[EPA specifically requested input in three areas:] 3. The HRS Subsurface Intrusion Addition considers source strength in delineating ASCs and AOEs, in scoring likelihood of exposure, in assigning waste quantity specifically when estimating hazardous constituent quantity and in weighting targets in an ASC. The HRS algorithm for all pathways incorporates the consideration of source strength in determining an HRS site score. Could EPA further take into account source strength in performing an HRS evaluation?" DEQ suggests that EPA assign a higher score when non-aqueous phase liquid is present at a site in order to account for source strength. We appreciate EPA's thoughtful approach for incorporating subsurface intrusion into this proposed rule, and we look forward to EPA's responses to public comment.	*Based on comments received on this question, EPA has added consideration of the presence of non-aqueous phase liquids (NAPLs) when assigning a degradation factor in Section 5.2.1.2.1.2, Degradation, of the HRS SsI Addition, and in the assignment of weighting factors to populations within an area of subsurface intrusion in Section 5.2.1.3.2.3, Population within area(s) of subsurface contamination, of the HRS SsI Addition.*

Submitter: 0096 – Maureen Sullivan, Department of Defense (DoD), Environment, Safety, and Occupational Health

Public Submission Posted: 05/03/2016

ID: EPA-HQ-SFUND-2010-1086-0096

Comment	Response
Proposed Revision / Comment: Although the proposed rule claims it will "have minimal impacts on federal facility cleanup programs," it is unclear whether this is true based on the review conducted by DoD. The proposed rule is lengthy, highly complex, lacks transparency in some places, and the methods for prioritizing vapor intrusion (VI) potential are inconsistent with the June 2015 EPA chlorinated VI and petroleum hydrocarbon (PVI) guidance documents. DoD's review has identified numerous technical issues with the proposed rule which affect its usability/defensibility for scoring sites for inclusion on the NPL. How does EPA intend to fill the gaps with the technical issues and address the ambiguities and inconsistencies in between the 2015 Vapor Intrusion Guide and the proposed rule? These technical gaps need to be addressed before DoD can appropriately evaluate the proposed rule's full impact. EPA should delay promulgation of the rule until guidance for the full implementation of the rule is available.	*The Hazard Ranking System (HRS) Subsurface Intrusion (SsI) Addition will not have a significant impact on federal facility cleanup programs. Federal agencies currently address subsurface intrusion issues as part of their environmental programs and authorities, and this rulemaking has no impact on that authority. Executive Order 12580 [sec. 2. (e)(1)] delegates broad Comprehensive Environmental Response Compensation, Liability Act (CERCLA) authority to federal agencies for responding to actual and potential releases of hazardous substances where a release is either on, or the sole source of the release is from, any facility or vessel under the jurisdiction, custody, or control of the federal agency. Federal agencies are required to exercise this authority consistent with the requirements of CERCLA section 120, as amended, and implement regulations under the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) for both National Priorities List (NPL) and non-NPL sites. If federal agencies are addressing contamination using authority under CERCLA and Executive Order 12580, and are managing cleanup consistent with CERCLA, then EPA would have no reason to pursue listing on the NPL; therefore, this rulemaking is expected to have minimal impacts on federal facility cleanup programs.* *Regarding the comment that the SsI component is lengthy, EPA notes that the HRS SsI Addition is consistent with the other HRS pathways and components in complexity, length and scope; and is designed, as was the intent of Congress, to rank sites relative to each other based on a time-limited screening assessment. Furthermore, EPA has not written the rule to be any longer than necessary and has made revisions to the rule for clarity, which have shortened the rule where commenters identified areas and processes that would allow simplification but still be consistent with the HRS concept.* *Regarding the commenter's assertion that the proposed HRS SsI Addition lacks transparency, is highly complex, and is inconsistent with EPA's Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air (June 2015) and Technical Guide for Addressing Petroleum Vapor Intrusion at Leaking Underground Storage Tank Sites (June 2015), EPA has modified the HRS SsI Addition, where appropriate, in response to specific comments, I and a summary of changes made are identified in the preamble to the promulgated HRS (see Section IV.A, Changes Since Proposal). Within this response to comments document, EPA has also responded to all specific comments on these topics that were submitted by the commenters. Also in responding to comments, EPA has provided explanations as to why the HRS does not appear to be consistent with EPA's vapor intrusion (VI) guidance document, the rationale in many cased being that the HRS evaluation is performed at a stage in the EPA vapor intrusion investigation and remediation process in which sufficient site-specific information is not available to accurately predict site-specific risk.* *Regarding the commenter's request that EPA delay promulgation of the rule until guidance for implementation of the SsI component is developed, EPA does not agree that promulgation of the HRS SsI Addition needs to be delayed. Guidance on implementation of the HRS SsI Addition is not necessary for evaluating the SsI component, which is a scoring mechanism and does not identify procedures for data collection. EPA considers discussion of procedures for collecting the data to be used in an HRS evaluation to be appropriate discussion for guidance and that future guidance will be developed as EPA gains experience in implementation of this rule. EPA notes that the VI guidance document contains methods for data collection for VI investigations. EPA also notes that to delay addressing sites that may pose a significant human health risk until all guidance documents have been developed would not be consistent with EPA's mandate to protect human health.*
Proposed Revision / Comment: EPA continues to disagree with the DoD comment that the level of data resolution necessary is generally not available from a PA/SI to effectively assess and score the subsurface intrusion component. DoD comments below provide additional rationale as to why this original comment is even more relevant because the scoring process is inconsistent with the state of VI science. The proposed rule refers to an "expanded" SI, which implies that current PA/SI data collection and investigation procedures would not be sufficient. Expanding the SI equates to increased costs to the regulated community.	*The level of data resolution necessary is available from a site inspection (SI) because the purpose of an SI is to obtain the data necessary to score a site using the HRS.* *Regarding the commenter's assertion that the SsI component scoring process is inconsistent with the state of vapor intrusion science, the provided comment does not identify any specific sections of the rule that are inconsistent with the state of science. EPA has responded in this support document to all specific comments provided by this commenter that are related to the scoring process and inconsistency with the "state of VI science" and has explained that it is consistent with the state vapor intrusion science, when the level of site-specific data available at the time of an HRS evaluation is considered.*

Comment	Response
	The commenter's assumption that an expanded site inspection (ESI) is an additional requirement specifically for SsI evaluations is incorrect. The ESI is not an evaluation specific to the HRS SsI Addition. ESIs have been performed for the other HRS pathways and an ESI is not a new form of a SI. The purpose of an ESI is to fill gaps in information not collected during the initial SI to determine if a site qualifies for the NPL based on an HRS score at or above a score of 28.50. If a site inspection was performed prior to this rulemaking it is likely that additional sampling, and different types of samples, may be required for performing an HRS SsI evaluation. However, the SsI Addition evaluation is still designed to be used with relatively limited data. Furthermore, as is the case with the other HRS pathways, the level of effort required to evaluate a site already varies on a site-by-site basis depending on the size and extent of contamination at the site and the number of HRS pathways that warrant evaluation. Therefore, it cannot be predicted with certainty that there will be an overall increase in cost or level of effort for any particular site due to the HRS SsI Addition. *Further if there is an increased cost due to the need at some sites to perform an SsI evaluation, this evaluation is required by CERCLA which requires the HRS to reflect risk at sites as accurately as possible, and the costs are offset by the benefits resulting from protection of human health.*
Proposed Revision / Comment: While EPA has clarified their intent to exercise discretion in rescoring legacy sites, the proposed rule remains ambiguous as to whether EPA intends to re-score Federal Facilities that did not previously score high enough to be listed on the NPL. It is also not clear how the proposed rule might impact the prioritization of these sites. EPA stated that potential SsI sites are a high priority. However, DoD has already prioritized, planned, programmed, and budgeted for sites currently in the cleanup process. This rulemaking may cause DoD to spend resources to reprioritize VI sites over other sites with a higher risk.	*In response to the commenter's concern regarding whether EPA intends to re-score Federal sites that did not previously score high enough for NPL listing, discussion of re-scoring of sites within the SsI component is not a comment relevant to this rulemaking. The SsI component is a method for evaluating sites with possible SsI issues for placement on the NPL, not for establishing EPA policy as it applies to selecting sites for scoring. Promulgation of this HRS SsI Addition has no impact on EPA's procedures for identifying sites for evaluation or re-evaluation using the HRS.* *Regarding the commenter's concern about possible impact of the HRS SsI Addition on the prioritization of Federal sites, the SsI component simply offers a way to prioritize sites with possible SsI threats within the construct of the HRS and CERCLA in cases where that is appropriate. Federal agencies currently address subsurface intrusion issues as part of their environmental programs and authorities, so the threat posed by subsurface intrusion of contaminants into regularly occupied structures should already be addressed in Federal agency planning and remedial activities, therefore, EPA does not expect this rulemaking to result in a change in the current prioritization of Federal sites. Executive Order 12580 delegates broad CERCLA authority to federal agencies for responding to actual and potential releases of hazardous substances where a release is either on, or the sole source of the release is from, any facility or vessel under the jurisdiction, custody, or control of the federal agency. Federal agencies are required to exercise this authority consistent with the requirements of CERCLA section 120, as amended, and implement regulations under the NCP for both NPL and non-NPL sites. Therefore, federal agencies are in a position to proactively identify and respond to risks posed by subsurface intrusion of hazardous substances into regularly occupied structures for all populations who live and work in areas where the subsurface environment may create exposures. If it is determined that releases of hazardous substances pose immediate threats to public health and the environment, EPA fully expects that the appropriate federal agency will continue to undertake response actions to address such threats. Many federal agencies, including EPA, have developed or are developing new or updated agency-specific policy and guidance documents to address subsurface intrusion threats. As a result of federal agency existing environmental programs and authorities, this rulemaking is not anticipated to have a significant impact on the resources and costs to federal cleanup programs.* *However, to clarify EPA's current policy regarding re-evaluation of sites previously assessed using the HRS that did not qualify for the NPL, EPA does not plan to initiate a comprehensive program to re-evaluate non-NPL sites to determine whether they would now be eligible for placement on the NPL. However, sites not on the NPL, whether under the jurisdiction of federal agencies or not, may need to be re-evaluated for the NPL using the amended HRS in the future if new information, or consideration of the SsI threat or any other threat, indicates the overall threat posed by the release at the site may be unacceptable. Conditions at sites may change over time and new information or changes in science could identify the need for further investigation at a site and perhaps the need for response action. Just as for other situations when new information becomes available for any site, if EPA, a state, tribe or other federal agency determines it is appropriate to re-evaluate a site, or change its priority for further action, it can do so using its existing or future budget resources. EPA works in consultation with the lead agency at a site, be it state, tribal, or federal, to determine the appropriate steps to re-evaluate such sites.*
Proposed Revision / Comment: The EPA continues to assert that they do not expect an increase in the number of site assessments per year, contrary to the expectation that the proposed rule would likely have an impact on Federal Facilities. Additional analyses are needed to support this claim, given the potentially flawed scoring process (see additional comments below).	*EPA disagrees with the commenter's assertion that the agency's expected realignment and reprioritization of its internal resources and Cooperative Agreement funding toward SsI evaluations implies that more assessments and complex evaluations will occur. EPA assumes the overall appropriated Superfund budget as well as EPA's Cooperative Agreement budget for performing site assessments will continue to remain relatively steady and does not expect that there will be additional funds made available to conduct additional site assessments. Therefore, the*

Comment	Response
Additionally, for EPA to say that the Agency expects a realignment and reprioritization of its internal resources and Cooperative Agreement funding toward SsI evaluations implies that more assessments and complex evaluations will occur.	*number of site assessments or NPL proposals conducted each year will not significantly increase. EPA's budget for site assessment is dependent on Congressional appropriations and EPA does not expect the rulemaking to impact appropriations. Additionally, EPA's budget for site assessment has remained relatively constant for the last several years. Hence, EPA expects that the allocation of available resources may be changed to reflect this rulemaking, but will continue to be optimized by EPA, its state and tribal partners, and other federal agencies to evaluate priority sites. Regarding the commenter's assertion that more complex evaluations will result from this rulemaking, EPA notes that the sampling required to implement the SsI component is similar to that required for evaluating sites using other HRS pathways and components and is within the scope of a time-limited screening assessment. EPA agrees that the collection of different types of data may be needed, and may require a longer average sampling event, to score the SsI component than for other types of HRS evaluations, Furthermore, the number of samples and level of effort required to evaluate a site using the 1990 HRS already varies on a site-by-site basis depending on the size and extent of contamination at the site; this will not change with the addition of the SsI component.*
Proposed Revision / Comment: EPA continues to assert that conducting an HRS evaluation imposes no direct costs on any private entity. DoD agrees that "conducting" an HRS evaluation imposes no direct cost to the regulated community however there is an additional cost associated with the expanded data collecting and analysis necessary to conduct the evaluation. Additional details and analysis of costs, along with a more technically transparent and defensible scoring process are needed to support EPA's assertion.	*Regarding the commenter's concern about an additional cost associated with the expanded data collection and analysis necessary to conduct an SsI evaluation, EPA considers the sampling required to implement the SsI component to be similar in scope and expense to that for evaluating sites using other HRS pathways and components, and to be within the scope of a time-limited screening assessment. However, EPA agrees that in some cases the scope of an SI may need to be expanded to collect the information necessary to evaluate the SsI threat present at a site or that an ESI to fill data gaps may be needed. EPA also agrees that implementation of the SsI component will likely require data (e.g., indoor samples) to be collected that is not discussed in EPA's Guidance for Performing Site Inspections Under CERCLA (September, 1992) and may require a longer than average duration sampling event than for evaluation of sites under other HRS pathways or components. As is the case with the other HRS pathways, the level of effort required to evaluate a site already varies on a site-by-site basis depending on the size and extent of contamination at the site. Therefore, it cannot be predicted with certainty that there will be an overall increase in cost or level of effort for any particular site due to the HRS SsI Addition.* *Regarding providing additional details and analysis of costs, EPA considers the consideration of expenses related to the promulgation of the HRS SsI Addition presented in the Regulatory Impact Analysis (provided in the docket for this rulemaking) associated with this final rule sufficient. The commenters have not provided sufficient data to demonstrate EPA's conclusion on the cost associated with this rulemaking to be incorrect.* *Regarding the commenter's stated need for a more technically transparent and defensible scoring process, in this document, EPA responds to all specific comments relating to the costs of the HRS SsI Addition and the technical transparency and defensibility of the HRS SsI Addition where applicable and has revised the SsI addition where appropriate.*
Proposed Revision / Comment: Questions remain regarding the basis for defining observed exposure for structures with measured concentrations below health-based screening levels. While EPA acknowledged in response to previous DoD comments that there are uncertainties with the number of sampling events needed, the current scoring process does not appropriately account for buildings with multiple rounds of indoor air data that demonstrate no VI impacts.	*An observed exposure does not necessarily indicate an exposure to concentrations of hazardous substances above a health-based benchmark has occurred. It only indicates an exposure to a hazardous substance with concentrations significantly above background levels has occurred during a limited sampling event, and that the hazardous substance is attributable to the site (see HRS Section 5.2.1.1.1, Observed exposure). Given that the variability in vapor intrusion rates, both spatially within structures and temporally within the same structure, has been shown to be at least several orders of magnitude, EPA considers it appropriate to rank sites higher for further investigation where it has been documented that subsurface intrusion is occurring during a time-limited screening assessment than those sites where the occurrence of subsurface intrusion has not been documented. That populations are not exposed to concentrations above health-based benchmarks during a limited sampling event does not mean that the level of observed exposure can be predicted to be below health-based benchmarks during other time periods. For HRS purposes, populations exposed to Level II concentrations (concentrations below a health-based benchmark) represent a possible human health threat that may warrant further investigation.* *Furthermore, HRS Section 5.2.0 General considerations, indicates regularly occupied structures can be excluded from an SsI evaluation if available information indicates occupants of the structures are not at an unacceptable risk, nor could they become they become at risk due to subsurface intrusion. Criteria to determine the number of sampling events necessary to determine no unacceptable risk will occur is an appropriate subject for future guidance, but will likely require determination of the confidence levels in such a decision.*
Proposed Revision / Comment: The preliminary review of the SsI scoring methodology indicates that, in many aspects, it is inconsistent with the	*EPA disagrees with the commenter's statement that the SsI component is inconsistent with the current state of the science when prioritizing or assessing VI potential, and is in conflict with EPA's June 2015 finalized VI and petroleum vapor intrusion (PVI) guidance documents (Technical*

Comment	Response
current state of the science when prioritizing or assessing VI potential and in conflict with EPA's June 2015 finalized VI and PVI guidance documents. This undermines EPA's stated objective to have a national program to "consistently and comprehensively evaluate and, if warranted, address subsurface intrusion contamination." Examples of inconsistencies between the methods and technical justification in this proposed HRS rule compared with EPA's final VI and PVI guidance documents are provided in the specific comments below.	*Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air, June 2015, hereinafter referenced as EPA's VI guidance, and Technical Guide for Addressing Petroleum Vapor Intrusion at Leaking Underground Storage Tank Sites, June 2015, hereinafter referenced as EPA's PVI guidance). The method for prioritizing sites using the SsI component for placement on the NPL is not inconsistent with EPA's VI and PVI guidances. The purpose of EPA's VI and PVI guidances are to address the investigation and assessment of the site-specific threats posed by vapor intrusion into structures from all sources under all Office of Land and Emergency Management (OLEM) programs, particularly for determining the need for response actions under CERCLA and the Resource Conservation and Recovery Act (RCRA). The HRS is an individual step in such an action under CERCLA and is used to prioritize sites for further investigation to determine the need for response actions under CERCLA. EPA VI and PVI guidances and HRS SsI Addition work in concert in the evaluation of SsI threats. The HRS SsI Addition and the EPA VI and PVI guidances both address the threat posed by vapor intrusion and are based on the same scientific principles; however, these documents serve different purposes and support different phases of the Superfund remedial process and the decision criteria in each were not designed to be, nor need to be, consistent in all aspects.* *The purpose of the EPA's VI and PVI guidances is to guide the investigation and assessment of the threat posed by vapor intrusion into structures from all sources under all OLEM programs, particularly actions taken under CERCLA and RCRA. The HRS SsI Addition is an amendment to the NCP, under CERCLA to allow placements of sites on the NPL based on the threat individually posed by subsurface intrusion (both contaminated ground water and vapor intrusion) or in combination with other contaminant migration and exposure routes. Placement of a site on the NPL is a required step to allow further investigation and, if needed, remedial actions under CERCLA. The HRS SsI Addition is not guidance and uses data collected from time-limited screening assessments to rank the relative threat posed by sites. The HRS SsI Addition does not address such subjects as data collection and sampling procedures.* *EPA also notes that the prioritization of sites for further investigation using the HRS is designed to be performed at the stage of a site investigation process in which only a time-limited screening assessment has been completed, and the information to make many of the decisions and concepts discussed in the VI and PVI guidances has not been collected. For example, the HRS prioritizes sites for collection of data necessary to make remedial site decisions, and an HRS evaluation is not designed to identify the need for remedial actions. Once this difference in purposes is understood, the seeming inconsistencies between the HRS and the EPA VI guidances are resolved.*
Proposed Revision / Comment: DoD conducted a scoring exercise on a few test sites using the proposed rule and information in the TSD. A brief description of the DoD test sites scored, along with the results are provided as an attachment to these comments. This exercise identified significant challenges with understanding and implementing the SsI scoring methodology. The DoD has concluded that the process and basis for scoring the factors are not clear or transparent, not consistent with current best practices for prioritizing or assessing VI sites, and not consistent with EPA's June 2015 VI and PVI final guidance documents. This DoD scoring exercise clearly identified the parameters and scenarios to which the process is most sensitive, with results that are not consistent with current VI best practices. For example, scoring of relatively representative industrial sites that constitute more than 80-percent of DoD VI sites clearly indicated that it does not account for the magnitude of subsurface or indoor air concentration and the importance of these factors in assessing VI potential. The scoring also does not account for differences documented at more than 50 DoD industrial sites in the fate and transport of VOCs into industrial buildings, and the corresponding VI potential compared with residential sites. These conclusions were based on DoD scoring of four types of representative industrial sites with low or high groundwater concentrations and no indoor air data (Test Sites A and B) and sites with low or relatively high indoor air concentrations (Test Sites C and D). A fifth test site (Test Site E) was scored assuming the area of observed exposure (AOE) consisted of a regularly occupied Barracks building. The results from the scoring of Test Site E were relatively consistent with the test sites scored by EPA in Appendix D of the TSD where residential population targets were present. This exercise indicated that the proposed scoring process is weighted towards residential, school, and day care population targets and generally not consistent with the methods for assessing VI potential in the EPA 2015 Final VI and PVI guidance documents. Test Sites A and B scored relatively low with very little or no differences in scores between industrial sites with 3 versus 30,000 µg/L TCE in groundwater (no indoor air data) or industrial buildings with 1.5 versus 400 µg/m3 TCE in indoor air. A regularly occupied barracks building had a significantly higher SsI score (above the NPL listing criterion of 28.5) compared with the industrial sites, regardless of the subsurface or indoor air concentrations. These results highlight	*EPA has reviewed all specific comments and scoring examples provided by the commenter, and have responded to the appropriate comments in this document. As it pertains to the commenter's provided scoring scenarios, EPA does not consider these sites to be representative of typical sites that will be evaluated using the SsI component. The hypothetical examples are all industrial sites and appear to have been created specifically to reflect specific breakpoints in HRS scoring, and although they may be in the range of possible situations, they have not been shown to be typical or common situations (e.g., a minimum building size was selected to barely achieve a higher hazardous waste quantity factor value, depths were selected to be within a breakpoint in the ranges to achieve a certain weighting value).* *In addition, DoD's scoring examples do not demonstrate that the SsI component results in inappropriate decisions based on the data typically available at the time of an HRS evaluation. Two of the examples have subsurface contamination levels that are several orders of magnitude different, but have similar HRS site scores. DoD argues that the SsI component does not differentiate between these two situations and that the example with the higher subsurface contaminant concentration would actually pose a greater risk, based on state of science factors used to project indoor contaminant levels when the actual long-term subsurface contaminant exposure levels are known. However, this degree of difference in subsurface contaminant concentrations between the two scoring examples is well within the range of variation in contaminant levels over time found in several site studies. Therefore, these two examples actually show that the difference in contaminant concentrations may not actually pose a different level of risk, and determination of whether there is a difference in actual risk levels can only be made if the sites are further sampled. Two of the other scoring examples are situations in which indoor-air concentrations demonstrate subsurface contamination is occurring: one with a measured concentration below a health-based benchmark, and one with a measured concentration above a health-based benchmark. The site with a concentration below a health-based benchmark scores slightly below 28.50, the cutoff score for qualifying for the NPL. The example with a concentration above a health-based benchmark scores slightly above 28.50. DoD argues that the difference in contaminant levels should correspond to a greater difference in site scores. This argument is based on the assumption that concentrations measured during a limited sampling event are actually representative of site-specific exposure levels; however, EPA considers it to not be protective of human health to assume that contaminant concentrations collected during a limited sampling event is representative of actual exposure levels over time. Therefore,*

Comment	Response
the need for a more thorough and careful review, along with revisions to the scoring process and TSD prior to finalizing the proposed rule.	*EPA considers that the HRS does accurately reflect the possible relative risk posed by the two sites when only screening level information is available.* *DoD identified a fifth scoring example of a barracks with a significantly higher population than that associated with the same subsurface contaminant levels as an industrial facility, but did not provide the information necessary for EPA to determine the accuracy of the scoring by DoD. However, it appears that the difference in site scores between the fifth scoring example and the others is due to the population associated with the sites. EPA considers it reasonable to assign a higher score to sites with a larger number of exposed or potentially exposed individuals than to a site with fewer individuals.* *In addition, DoD proposed changes to the scoring process in the weighting of populations which it felt addressed the above supposed weaknesses, however, the changes were based on projecting site-specific risk based on data from a limited sampling event, which, as identified above, cannot not be performed with reasonable confidence due to the large amount of variation of contaminant concentrations spatially and temporally. The changes also would result in one of the scoring example sites not scoring above 28.50 even though 31 workers were exposed to contaminant levels above health-based benchmarks. This would result in the same number of individuals exposed to levels above health-based benchmarks qualifying for the NPL if the exceedances were associated with all other HRS pathways and components, except for the SsI component. It is inconsistent that the same level of risk would not qualify a site for the NPL simply because an individual has been exposed to hazardous substances by different exposure routes.*
Proposed Revision / Comment: While DoD acknowledges the importance of evaluating a subsurface intrusion pathway, we believe existing regulations and guidance are sufficient to ensure the pathway is adequately addressed during site investigations without the additional measures of modifying the HRS scoring. Of particular concern to the DoD is EPA's assumption that sufficient data will be collected during the Site Inspection to allow a credible evaluation and scoring process to occur. For example, is it reasonable for EPA to expect that multiple lines of evidence will be sufficiently collected during SI activities to assess vapor intrusion? Will household chemicals really be removed from a structure prior to sampling? At the same time, EPA acknowledges that SIs are of limited duration and are conducted over a limited time period of 1 to 2 days. With the overwhelming complexities associated with vapor intrusion assessments and the years of effort that have gone into the development and revision of the Agency's vapor intrusion guidance documents, it seems unlikely that any indoor sampling at the SI phase would be comprehensive enough and would more than likely identify chemicals above a benchmark to be associated with vapor intrusion when in fact they are not. The end result would be overscoring and proposed placement on the NPL when it is unnecessary. It is not clear how an "expanded SI" will be different from a remedial investigation (RI) conducted at vapor intrusion sites. EPA's previous guidance has suggested that an expanded SI for other media typically involved 30 samples and 600 technical labor hours (EPA/540-R-92-021, 1992). This is not a realistic estimate in terms of the number of samples and level-of-effort for an expanded SI that requires a UFP QAPP, sampling and analysis, and a determination of the vapor source (i.e., attribution). Sample collection and lab analysis requires a UFP QAPP (https://www.epa.gov/sites/production/files/2014-02/documents/ufp_qapp_faq.pdf) to ensure adequate data quality use and decision metrics. Preparation of a UFP QAPP generally requires 3 months to a year and costs up to $100K. DoD does not understand how functionally the EPA's vision of an expanded site investigation for SsI HRS scoring differs from that described in Chapter 6 "Detailed Investigation" of the 2015 EPA final VI guide.	*EPA disagrees with the commenter's assertion that existing regulations and guidance are sufficient to ensure subsurface intrusion at non-federal sites is adequately addressed during site investigations without the additional measures of modifying the HRS scoring. Promulgation of this rule is not contingent on identifying a defined set of sites with subsurface intrusion contamination; rather promulgation is contingent on complying with the CERCLA 105 (a)(8)(A) mandate. Not having the ability to evaluate threats due to subsurface intrusion, a known risk to human health, is contrary to the CERCLA 105 mandate. Specifically, CERCLA 105 (a)(8)(A), requires EPA to amend the HRS "to assure to the maximum extent feasible, that the HRS accurately assess the relative degree of risk to human health and the environment posed by sites and facilities subject to review." Furthermore, the purpose of CERCLA is to address sites with significant risk to human health that have not or cannot be addressed under other programs. It is EPA's experience that despite other programs that can address SsI, there are limitations (e.g., statutory exclusions, funding, resources) that prevent other programs from addressing the contamination. Sites that may present a lower risk to populations than those that qualify for the NPL or are statutorily excluded from being addressed under CERCLA are deferred to the appropriate organization. This is part of EPA's standard site assessment process that has not changed with the addition of the SsI component. However, under the 1990 HRS those sites with the potential to put populations at risk due to contamination from SsI could not be evaluated for placement on the NPL. Revising the HRS to include an SsI component fulfills EPA's statutory obligation to accurately assess the relative degree of risk to human health and the environment.* *Regarding the commenter's questioning the reasonableness of expecting that sufficient data will be collected during an SI, such as multiple-lines-of-evidence, to support the SsI evaluation, it is not unreasonable to expect multiple-lines-of-evidence to be documented during, or prior to, an SI, such as geologic boring logs, and ground water, soil, and indoor air samples. EPA notes that the sampling required to implement the SsI component is similar to that required for evaluating sites using other HRS pathways and is within the scope of a time-limited screening assessment. The required sampling is not equivalent to that needed to fully characterize the nature and extent of the contamination and risk at the site. However, EPA agrees that implementation of the SsI component will likely require data to be collected (e.g., indoor air samples) that is not discussed in EPA's Guidance for Performing Site Inspections Under CERCLA (September, 1992), and may require a longer duration than the average sampling event for evaluation of sites under other pathways in the HRS.* *To clarify the difference between an ESI and a remedial investigation (RI), an RI is designed to collect sufficient information to perform a site-specific risk assessment and to document whether or not further remedial action is necessary. An ESI is designed to collect additional data beyond that which was collected during an initial SI for the purposes of HRS scoring. An ESI is typically reserved for more complex sites and to address data gaps resulting from SI activities. SIs and ESIs are performed prior to placement of a site on the NPL. An RI is performed after placement of the site on the NPL and is designed to collect the data necessary to adequately characterize the site for the purpose of developing and evaluating effective remedial alternatives. The ESI occurs prior to listing. Concerning how the ESI differs from the investigation described in EPA's final VI guidance, Chapter 6 of the EPA VI guidance involves a level of investigation more in line with the efforts of an RI, and beyond that of an SI or ESI.*

Comment	Response
	The EPA VI guidance is not guidance specifically for the SsI component; however, many of the concepts identified in Chapter 6 of the EPA VI guidance may be relevant for consideration during an SI or ESI.
EPA Policy Language: The agency considers that including the evaluation of subsurface intrusion in the HRS serves the public interest by widening EPA's ability to evaluate these threats. **Proposed Revision / Comment:** Although it is true that the proposed rule would widen EPA's ability to evaluate potential VI threats, the scoring process is not consistent with best practices nor EPA's 2015 final VI and PVI guidance. The technical inconsistencies and basis for the cost analysis need to be addressed/revised before EPA asserts that including subsurface intrusion in the HRS serves the public interest, particularly if sites that pose no real VI threat trigger their inclusion on the National Priorities List (NPL).	*EPA has reviewed the comments submitted on the preamble to the proposed HRS SsI Addition during the public comment period and responded accordingly. In some cases, changes were made to the preamble and regulatory impact analysis (RIA) for the final rulemaking in response to the comments submitted. Regarding the commenter's questioning that the HRS SsI Addition will not result in additional site assessments being conducted on an annual basis, EPA reiterates that the number of site assessments conducted each year will not significantly increase. EPA's budget for site assessment is dependent on Congressional appropriations and EPA does not expect the rulemaking to impact appropriations. Additionally, EPA's budget for site assessment has remained relatively constant for the last several years. Hence, EPA expects that the allocation of available resources may be changed to reflect this rulemaking, but will continue to be optimized by EPA, its state and tribal partners, and other federal agencies to evaluate priority sites. Regarding the commenter's assertion that more complex evaluations will result from this rulemaking, EPA notes that the sampling required to implement the SsI component is similar to that required for evaluating sites using other HRS pathways and components and is within the scope of a time-limited screening assessment. However, EPA agrees that implementation of the SsI component will likely require data to be collected that is not discussed in EPA's present SI guidance, (e.g., indoor samples) and may require a longer average sampling event that for evaluation of sites under other pathways in the HRS. However, the number of samples and level of effort required to evaluate a site using the 1990 HRS already varies on a site-by-site basis depending on the size and extent of contamination at the site; this will not change with the addition of the SsI component.* *Regarding the commenter's question if it is EPA's intention to reduce the number of site investigation using other HRS pathways or components, it is not EPA's intention to reduce the use of the other HRS pathways and components to evaluate sites. The purpose of this rulemaking is to be able to add sites on the NPL that represent a risk to human health from vapor intrusion, but that could not be added using the other pathways of the HRS. This is in keeping with CERCLA 105 (a)(8)(A), which requires EPA to amend the HRS "to assure to the maximum extent feasible, that the HRS accurately assess the relative degree of risk to human health and the environment posed by site and facilities subject to review." The addition of the SsI component to the HRS allows sites to be evaluated more comprehensively to consider the relative risk posed by a site.* *EPA has reviewed all specific comments provided during the public comment period and modified the SsI component as appropriate. (Please see responses to specific comments in this document for further discussion of topics related to the SsI components scoring methodology.) Furthermore, EPA asserts that the SsI component does not change the purpose of the HRS, its fundamental structure or its application. It does not change the balance between the pathways or calculation of the overall HRS site score and the same cutoff score to qualify a site for the NPL is maintained. The narrow technical modifications resulting from this rulemaking reflect the agency's actions to encompass additional risks posed by releases of hazardous substances and to address the SARA statutory requirement that EPA amend the HRS to assure "to the maximum extent feasible, that the HRS accurately assesses the relative degree of risk to human health and the environment posed by sites subject to review."* *Regarding the commenter's assertion that the assumption in the regulatory impact analysis (RIA) for this rulemaking that 20 SsI sites will be assessed in place of 20 non-SsI sites is incorrect or will not effectively prioritize SsI sites nationwide, EPA notes that this assumption is based on a survey conducted of EPA Regions indicating that approximately 10 percent of sites assessed will likely have SsI threats. As noted previously, the purpose of the HRS SsI Addition is to enable the HRS to be used to more comprehensively evaluate and prioritize the relative risk posed by a site that may not be addressed by another program. The purpose of the HRS SsI Addition is not to evaluate and prioritize all subsurface intrusion sites nationwide. As described in Section II.B, Site Assessment and the Superfund Remedial Process, of the preamble to the HRS SsI Addition, the majority of sites evaluated through EPA's site assessment program do not meet the criteria for possible placement on the NPL and are "screened out" of the Superfund Remedial process.*
EPA Policy Language: EPA does not expect that this proposed change will result in additional site assessments being conducted per year. However, because subsurface intrusion sites have the potential to pose a higher level of risk than other exposure routes based on site-specific factors such as exposure duration, EPA expects that there will be a realignment and reprioritization of its internal resources and Cooperative Agreement funding toward subsurface intrusion evaluations.	*The number of site assessments or NPL proposals conducted each year will not significantly increase. EPA acknowledges that in some cases the scope of a typical SI may need to be expanded to collect the information necessary to evaluate the SsI threat present at a site. However, EPA's budget for site assessment is dependent on Congressional appropriations and EPA does not expect the rulemaking to impact appropriations. Additionally, EPA's budget for site assessment has remained relatively constant for the last several years. Hence, EPA expects that the allocation of available resources may be changed to reflect this rulemaking, but will continue to be optimized by EPA, its state and tribal partners, and other federal agencies to evaluate priority sites. Regarding the commenter's assertion that more complex evaluations will result from this rulemaking,*

Comment	Response
[EPA notes that this passage could not be located within the proposed HRS SsI Addition and supporting documents.] **Proposed Revision / Comment:** DoD commented on this passage previously (it is also repeated elsewhere in the document). It does not appear that there have been any changes in the language or attempts to further clarify the issues of concern to DoD, either here or elsewhere in the document. Because EPA perceives that subsurface intrusion has a potential to pose a higher level of risk than other exposure routes, it seems counterintuitive to expect that the proposed change in the HRS **will not** result in additional site assessments being conducted per year. Additionally, for EPA to say that the Agency expects a realignment and reprioritization of its internal resources and Cooperative Agreement funding toward SsI evaluations almost explicitly suggests that more assessments and complex evaluations will surely occur. EPA indicates that there may be additional site assessments for VI, but that the overall number of sites evaluated is not expected to change. While EPA could do VI assessments by foregoing soil direct ingestion or groundwater assessments (for example), DoD questions if it is EPA's intent to reduce the use of HRS for other pathways. Because the current VI pathway assessment in HRS is flawed, forgoing scoring of other sites/pathways in order to use a flawed HRS scoring process for VI is unwise. EPA should consider incorporating recommended changes in the SsI VI scoring so that the relative risks of SsI and other pathways is more accurately approximated by HRS. DoD believes either the assumption of 20 sites per year regulatory impact analysis is incorrect or the proposed HRS SsI approach without expanding the number of assessments will not provide effective nationwide SsI site prioritization.	*EPA notes that the sampling required to implement the SsI component is similar to that required for evaluating sites using other HRS pathways and components and is within the scope of a time-limited screening assessment. However, EPA agrees that implementation of the SsI component will likely require data to be collected that is not discussed in EPA's present SI Guidance, (e.g., indoor samples) and may require a longer average sampling event that for evaluation of sites under other pathways in the HRS. Furthermore, the number of samples and level of effort required to evaluate a site using the 1990 HRS already varies on a site-by-site basis depending on the size and extent of contamination at the site; this will not change with the addition of the SsI component.* *It is not EPA's intention to reduce the use of the other HRS pathways and components to evaluate sites. The purpose of this rulemaking is to be able to add sites on the NPL that represent a risk to human health from vapor intrusion, but that could not be added using the other pathways of the HRS. This is in keeping with CERCLA 105 (a)(8)(A), which requires EPA to amend the HRS "to assure to the maximum extent feasible, that the HRS accurately assess the relative degree of risk to human health and the environment posed by site and facilities subject to review." The addition of the SsI component to the HRS allows sites to be evaluated more comprehensively to consider the relative risk posed by a site.* *EPA has reviewed all specific comments provided during the public comment period and modified the SsI component as appropriate. (Please see responses to specific comments in this document for further discussion of topics related to the SsI component's scoring methodology.) Furthermore, EPA asserts that the SsI component does not change the purpose of the HRS, its fundamental structure or its application. It does not change the balance between the pathways or calculation of the overall HRS site score and the same cutoff score to qualify a site for the NPL is maintained The narrow technical modifications resulting from this rulemaking reflect the agency's actions to encompass additional risks posed by releases of hazardous substances and to address the SARA statutory requirement that EPA amend the HRS to assure "to the maximum extent feasible, that the HRS accurately assesses the relative degree of risk to human health and the environment posed by sites subject to review."* *Regarding the commenter's assertion that the assumption in the Regulatory Impact Analysis (RIA) for this rulemaking that 20 SsI sites will be assessed in place of 20 non-SsI sites is incorrect or will not effectively prioritize SsI sites nationwide, EPA notes that this assumption is based on a survey conducted of EPA Regions indicating that approximately 10 percent of sites assessed will likely have SsI threats. For the purposes of the RIA at proposal, a baseline of 200 site assessments per year was assumed. This assumption of 200 site assessments was based on the annual number of preliminary assessment (PA) conducted between fiscal year (FY) 2011 and FY 2015. As noted previously, the purpose of the SsI component is to enable the HRS to be used to more comprehensively evaluate and prioritize the relative risk posed by a site that may not be addressed by another program.*
EPA Policy Language: EPA does not expect that this proposed change will result in additional site assessments being conducted per year. However, because subsurface intrusion sites have the potential to pose a higher level of risk than other exposure routes based on site-specific factors such as exposure duration, EPA expects that there will be a realignment and reprioritization of its internal resources and Cooperative Agreement funding toward subsurface intrusion evaluations. **Proposed Revision / Comment:** EPA remains unclear how the rule will be applied at legacy sites other than at EPA's discretion where they have noted reevaluation may occur on a case-by-case basis when new information becomes available. Previous DoD comments expressed concern that regulators or stakeholders may request the rescoring of sites based on the belief that inclusion of the SsI pathway will impact the HRS score.	*Promulgation of this HRS SsI Addition has no impact on EPA's procedures for identifying sites for evaluation or re-evaluation using the HRS except to factor in the consideration of the subsurface intrusion threat at candidate sites. EPA does not plan to initiate a comprehensive program to re-evaluate non-NPL sites to determine whether they would now be eligible for placement on the NPL. However, sites not on the NPL, whether under the jurisdiction of federal agencies or not, may need to be re-evaluated for the NPL using the amended HRS in the future if new information, or consideration of the SsI threat or any other threat, indicates the overall threat posed by the release at the site may be unacceptable. Conditions at sites may change over time and new information or changes in science could identify the need for further investigation at a site and perhaps the need for response action. Just as for other situations when new information becomes available for any site, if EPA, a state, tribe or other federal agency determines it is appropriate to re-evaluate a site, or change its priority for further action, it can do so using its existing or future budget resources. EPA works in consultation with the lead agency at a site, be it state, tribal, or federal, to determine the appropriate steps to re-evaluate such sites.*
EPA Policy Language: As stated previously, EPA is also considering sites with another form of subsurface intrusion, namely, intrusion of contaminated ground water into regularly occupied structures, which appears to be an emerging issue. … Under the proposed SsI addition, ground water intrusion would be evaluated using current conditions, which may involve situations where metals have precipitated from water or where volatile substances have entered a structure via infiltrating ground water. As EPA further explores this emerging issue, the agency considers it likely that other ground water intrusion sites requiring evaluation will be identified.	*The commenter's statement that the consideration of ground water intrusion into basements in the SsI component was included after 2011 and based on a suggestion from the 2011 peer review of the proposed SsI component is incorrect. Consideration of ground water intrusion into regularly occupied structures was included in in the SsI component at proposal. HRS Section 5.2.1.1.1, Observed exposure, states that an observed exposure by direct observation can be established when "[a] solid, liquid, or gaseous material that contains one or more hazardous substances attributable to the site has been observed entering a regularly occupied structure through migration via the subsurface…"* *Regarding the situation where ground water has intruded into a regularly occupied structure, the potential risk to human health posed by hazardous substances "off-gassing" from the ground water would be eligible for evaluation using the SsI component. Indoor air samples from*

Comment	Response
Proposed Revision / Comment: While the addition of groundwater intrusion into basements was a new pathway included in the SsI from 2011 to 2015, it appears to be in response to a suggestion by a reviewer in the 2011 peer review. The magnitude and potential risks associated with off-gassing from groundwater that has intruded into a structure should be considered. EPA should distinguish between strong sources entering structures (e.g., NAPL, highly contaminated groundwater) vs. trace concentrations in groundwater.	*such a structure could be collected and used to determine if they meet HRS observed exposure criteria.* *Regarding consideration of the magnitude of the concentrations of hazardous substances "off-gassing" from intruded ground water, EPA notes that the HRS in general, and in the SsI component specifically, already provides for the consideration of contaminant concentration data when indoor air contaminant concentrations are known (e.g., estimating the mass of hazardous substances that have entered regularly occupied structures [i.e., Tier A]), and that if this information is available it will be used in assigning the Hazardous Waste Quantity factor value for the SsI component. Indoor air concentration data is also considered in identifying observed exposures and in weighting receptors due to indoor concentrations above health-based benchmarks.* *Regarding situations where an observed exposure is documented based on direct observation, such as ground water intruding into the basement of a regularly occupied structure, the SsI component considers any eligible targets as exposed to Level II concentrations. However, EPA has added the consideration of contaminant concentration levels in the subsurface to the assignment of the degradation factor value and in the weighting of targets within areas of subsurface contamination (ASCs) in situations where non-aqueous phase liquids (NAPLs) are present. These revisions were made in response to comments that the proposed SsI component did not adequately reflect the magnitude of the threat posed by high contaminant concentrations in the subsurface environment.*
EPA Policy Language: EPA is also considering sites with another form of subsurface intrusion, namely, intrusion of contaminated ground water into regularly occupied structures—which is an emerging issue. **Proposed Revision / Comment:** Metals precipitating from groundwater is an entirely different pathway than volatiles partitioning from groundwater. Inclusion of groundwater intrusion as part of the SsI component to the HRS complicates the process of computing an HRS score, which might affect a very small number of sites with very shallow groundwater. DoD recommends excluding groundwater intrusion for the SsI sub score, and separately evaluating for inclusion in the groundwater pathway if necessary.	*EPA included consideration of ground water intrusion in the SsI component because this threat cannot currently be evaluated by 1990 HRS pathways and components. Subsurface intrusion contamination can occur through the migration of hazardous substances, pollutants, or contaminants from contaminated ground water directly into overlying regularly occupied structures, such as when basements become flooded due to high ground water elevations. Contaminants can then vaporize from the flood waters directly into indoor air, or when the water recedes or evaporates, contaminants may remain inside the structure. Ground water intrusion may be less common than VI but has been documented to result in health risks, and is an emerging issue only now being comprehensively investigated. Furthermore, identification of ground water intrusion is simplistic and in many cases should not significantly complicate the HRS evaluation process, because it is only evaluated when it is known to have occurred (i.e., actual ground water intrusion has been documented).* *During development of the SsI component, EPA ensured that the structure and methodology employed by the SsI component is consistent with the other HRS pathways and components. This assures that with the SsI component, the HRS Soil Exposure and Subsurface Intrusion Pathway: 1) maintains the same relative contribution to the site score as other pathways within the HRS, 2) maintains the integrity of the HRS structure, and 3) minimizes the number of sites potentially eligible for listing on the NPL and does not result in a significant number of false positives or false negatives. Adding the SsI component to the HRS Soil Exposure Pathway (and renaming the pathway the Soil Exposure and Subsurface Intrusion Pathway) structurally fits best, as both have receptors coming into contact with contamination and consider the relative risk posed by direct contact with existing contamination areas. Specifically, the focus of the threat is not migration of the subsurface contamination to the receptors, but instead is due to the receptors coming in contact with (i.e., exposure to) the contamination in specific locations where intrusion has occurred or is likely to be occurring. This contrasts with the migration pathways, in which the threat is due to the migration of the contamination to the receptors.* *During development of the SsI component, EPA considered whether the subsurface intrusion threat should be included in the 1990 HRS ground water migration pathway. However, EPA rejected this option mainly because the ground water pathway is focused on the threat via oral ingestion posed to people utilizing ground water in drinking water aquifers that has or could become contaminated by ground water contaminant migration. This pathway does not consider the fate and transport related impacts due to inhalation and dermal exposures resulting from the direct exposure to contamination resulting from the migration of contaminants from all sources of subsurface contamination, including ground water, regardless if it is present in a drinking water aquifer, or in soils or geologic strata under regularly occupied structures.*
EPA Policy Language: For example, a site was discovered where shallow (surficial) ground water contaminated with chromium had intruded into residential basements and after the water receded, or evaporated, a precipitate of chromium remained as a residue. **Proposed Revision / Comment:**	*The commenter may have misinterpreted the structure and methodology employed by the SsI component. The SsI component considers the potential threat posed by direct exposure to hazardous substances that have entered into regularly occupied structures from the subsurface. Subsurface intrusion can result in direct exposures via many routes, including via intruded ground water, however, the agency acknowledges that the most common form of subsurface intrusion is vapor intrusion. Therefore, the example site identified in the proposed HRS SsI Addition's preamble as having a threat to human health posed by chromium precipitate would be eligible for consideration by the SsI component, as the*

Comment	Response
The example of chromium precipitate provided here is not relevant for risk through the indoor air inhalation pathway. Any contamination related to groundwater intrusion should be assessed as part of groundwater pathway. Please note comment above.	*component considers the human health threat posed by direct exposure to contamination.* *During development of the SsI component, EPA considered whether the subsurface intrusion threat should be included in the 1990 HRS ground water migration pathway. However, EPA rejected this option mainly because the ground water pathway is focused on the threat via oral ingestion posed to people utilizing ground water in drinking water aquifers that has or could become contaminated by ground water contaminant migration. This pathway does not consider the fate and transport related impacts due to inhalation and dermal exposures resulting from the direct exposure to contamination resulting from the migration of contaminants from all sources of subsurface contamination, including ground water, regardless if it is present in a drinking water aquifer, or in soils or geologic strata under regularly occupied structures.*
EPA Policy Language: EPA also does not expect this proposed rulemaking to affect the status of sites currently on or proposed to the NPL. Sites that are currently on or proposed to the NPL have already been evaluated under another pathway (i.e., ground water migration, air migration, surface water migration, or soil exposure) and, in accordance with section 105(c)(3) of CERCLA, as amended, would not be re-evaluated. **Proposed Revision / Comment:** In evaluating the regulatory impact, DoD requests EPA acknowledge that federal agencies already have authority and are addressing VI, including sites not currently on the NPL, and use CERCLA-based processes at non-NPL sites. Therefore EPA will not pursue NPL listing for sites that are currently being appropriately managed using CERCLA-based processes. DoD appreciates the statement and agrees it will not affect the status of sites already on the NPL. DoD requests explicit clarification if EPA intends to go back and revisit HRS scores for DoD facilities that did not score 28.5 and were consequently not placed on the NPL. Clarification is warranted as this proposed rule could have a significant impact on DoD without having any affect on serving "the public interest by widening EPA's ability to evaluate these threats." The regulatory impact analysis prepared by EPA concludes that 1,073 sites across the US could have subsurface VI pathways which may warrant listing on the NPL. While it is likely that only a subset of these sites may impact federal facilities, this is not clear in the documentation of the proposed rule. For example, the listing of these sites in Appendix A of the TSD provides limited information identifying these sites. Additional details regarding these sites, along with an analysis of costs from added VI sites would help in defining cost impacts to the DoD. Please justify the following statement: "EPA does not expect that this proposed change will result in additional site assessments being conducted per year."	*The addition of the SsI component to the HRS does not change the current procedures EPA and other federal agencies have in place for addressing releases or threatened releases of hazardous substances under CERCLA. Federal agencies currently have the authority to address subsurface intrusion issues as part of their environmental programs. Executive Order 12580 [sec. 2. (e)(1)] delegates broad CERCLA authority to federal agencies for responding to actual and potential releases of hazardous substances where a release is either on, or the sole source of the release is from, any facility or vessel under the jurisdiction, custody, or control of the federal agency. Federal agencies are required to exercise this authority consistent with the requirements of CERCLA section 120, as amended, and implement regulations under the NCP, for both NPL and non-NPL sites. Therefore, federal agencies are in a position to proactively identify and respond to risks posed by subsurface intrusion of hazardous substances into regularly occupied structures for all populations who live and work in areas where the subsurface environment may create exposures. EPA expects that federal agencies are addressing subsurface intrusion contamination as part of their delegated environmental authority. If federal agencies are addressing contamination using authority under CERCLA and Executive Order 12580, and are managing cleanup consistent with CERCLA, then EPA would have no reason to pursue listing of a federal facility on the NPL.* *As the commenter has stated, the HRS SsI Addition should not affect the status of sites currently on, or proposed to, the NPL. Regarding re-evaluations of sites or facilities that had not previously achieved an HRS site score of 28.50 or greater using the SsI component, EPA notes that promulgation of this rulemaking has no impact on EPA's procedures for identifying sites for evaluation or re-evaluation using the HRS. The agency does not plan to initiate a comprehensive program to re-evaluate non-NPL sites to determine whether they would now be eligible for placement on the NPL. However, sites not on the NPL, whether under the jurisdiction, custody or control of federal agencies or not, may need to be re-evaluated for the NPL using the amended HRS in the future if new information, or consideration of the SsI threat or any other threat, indicates the overall threat posed by the release at the site may be unacceptable. Conditions at sites may change over time and new information or changes in science could identify the need for further investigation at a site and perhaps the need for response action. Just as for other situations when new information becomes available for any site, if EPA , a state, tribe or other federal agency determines it is appropriate to re-evaluate a site, or change its priority for further action, it can do so using its existing or future budget resources. In these situations, the re-evaluation of the threat posed by the site would include an evaluation of the site using the SsI component. EPA works in consultation with the lead agency at a site, be it state, tribal, or federal, to determine the appropriate steps to re-evaluate such sites.* *Regarding the 1,073 sites referenced by the commenter, EPA does not agree that additional technical or cost information on these sites is needed to support public review and comment on the HRS SsI Addition. EPA considers it inappropriate to provide additional details on the inventory of sites identified in Appendix A of the proposal Technical Support Document (TSD) for the HRS SsI Addition, as the agency does not want to raise erroneous perceptions of human health threats present at these sites. As described in the preamble to the promulgated HRS SsI Addition, the site inventory only identified sites with a potential subsurface intrusion threat. These sites were not used in the development of the HRS SsI Addition, but instead served as the basis for initially assessing the potential magnitude of the subsurface intrusion problem in general and support for the necessity of the rulemaking.* *Regarding the commenter's request for EPA to justify that the HRS SsI Addition will not result in additional site assessments being conducted on an annual basis, since EPA's overall appropriated Superfund budget as well EPA's cooperative agreement budget for performing site assessments is expected to continue to remain relatively steady, EPA anticipates that this final rule will not result in additional site assessments nor the placement of more sites on the NPL during any particular time interval, but rather a shift in the make-up of the type of sites included on the NPL. Instead, EPA expects that available resources will continue to be prioritized by EPA and its state and tribal partners, along with other federal agencies, to evaluate and prioritize those sites posing the greatest possible risk, but not to significantly increase the number of site assessments*

Comment	Response
	conducted each year.
EPA Policy Language: Because federal agencies already have the authority to address subsurface intrusion issues as part of their environmental programs, this proposed rule is anticipated to have minimal impacts on federal facility cleanup programs. **Proposed Revision / Comment:** The preamble states that there will be some costs for federal agencies, but incorrectly portrays it as minimal because it neglects the additional process related costs for NPL sites. Additionally and as noted elsewhere, it is unclear exactly where and how EPA intends to apply the HRS. It's true that federal agencies are already studying the subsurface intrusion of vapors as part of their environmental programs. And, these studies are resulting in new information about the contamination and risk which could drive a need to reassess an installation's HRS score. A change to the HRS may result in additional DoD installations being added to the NPL. This is not a minimal impact to a federal facility environmental cleanup program. A facility on the NPL is subject to much higher regulatory scrutiny, US EPA oversight, longer review times, a federal facility agreement, potential stipulated penalties, higher costs to administer and cleanup a site. Thus, the impacts to DoD could be much greater than EPA acknowledges and for no additional gain because DoD is already addressing VI at these sites.	*EPA continues to expect the cost impact to federal agencies resulting from the HRS SsI Addition to be minimal, if any. EPA notes that the HRS SsI Addition does not change the current authorities EPA and other federal agencies have in place for addressing releases or threatened releases of hazardous substances under CERCLA. Federal agencies currently address subsurface intrusion issues as part of their environmental programs and authorities. Executive Order 12580 [sec. 2. (e)(1)] delegates broad CERCLA authority to federal agencies for responding to actual and potential releases of hazardous substances where a release is either on, or the sole source of the release is from, any facility or vessel under the jurisdiction, custody, or control of the federal agency. Federal agencies are required to exercise this authority consistent with the requirements of CERCLA section 120, as amended, and implement regulations under the NCP, for both NPL and non-NPL sites. EPA expects that federal agencies are addressing subsurface intrusion contamination as part of their delegated environmental authority. Therefore, if federal agencies are addressing contamination using authority under CERCLA and Executive Order 12580, and are managing cleanup consistent with CERCLA, then EPA would have no reason to pursue placement on the NPL.* *Furthermore, this rulemaking, which could lead to the placement of a site on the NPL that did not qualify for the NPL previously, does not itself impose any costs on outside parties; it does not establish that response actions will necessarily be undertaken, nor does it determine liability for site response costs. Costs are limited to screening relevant sites for subsurface intrusion contamination during site inspections and the resulting HRS evaluation and documentation record preparation. Costs that arise from site remedial responses are the result of site-specific decisions made post-listing, not directly from the act of listing itself. Additionally, EPA also notes that these costs are a result of a release of hazardous substances and would not be incurred if hazardous substances had not been released.* *EPA acknowledges the commenter's statement that subsurface intrusion studies could result in new information becoming known about the contamination and potential risk present at a site, which could impact the site's HRS site score. However, the HRS SsI Addition has no impact on EPA's procedures for identifying sites for evaluation or re-evaluation using the HRS. EPA also does not plan to initiate a comprehensive program to re-evaluate non-NPL sites to determine whether they would now be eligible for placement on the NPL. However, sites not on the NPL, whether under the jurisdiction of federal agencies or not, may need to be re-evaluated for the NPL using the amended HRS in the future if new information, or consideration of the SsI threat or any other threat, indicates the overall threat posed by the release at the site may be unacceptable. For example, conditions at sites may change over time and new information or changes in science could identify the need for further investigation at a site and perhaps the need for response action. Just as for other situations when new information becomes available for any site, if EPA, a state, tribe, or other federal agency determines it is appropriate to re-evaluate a site, or change its priority for further action, it can do so using its existing or future budget resources. EPA works in consultation with the lead agency at a site, be it state, tribal, or federal, to determine the appropriate steps to re-evaluate such sites.*
EPA Policy Language: Later decisions that consider information collected under the proposed addition could separately have specific economic costs and benefits (e.g., remediation costs and reduced risk), but these impacts are contingent upon a series of separate and sequential actions after listing a site on the NPL. *[The commenter has referenced language that appears in Section III.C.1, but has referred to Section III.C.2]* **Proposed Revision / Comment:** Additional details on the sites listed in Appendix A of the TSD and the analysis of costs from added VI sites, along with a more technically transparent and defensible scoring process are needed to support the statement about "economic costs and benefits (e.g., remediation costs and reduced risk)." It is unclear whether EPA will re-visit scored federal facility sites that were not added to the NPL, which also has the potential for significant monetary impacts to federal facility cleanup programs. DoD continues to consider EPA's argument that there aren't economic costs until a site is actually listed as weak. In DoD's view, it is appropriate that the regulatory impact analysis consider the economic cost associated with reduced property values that occur when a site is listed on the NPL. While EPA acknowledges the possibility of some costs	*EPA disagrees that additional details on the sites listed in Appendix A of the TSD at proposal and the cost impacts of the rulemaking are needed to support the statement about "economic costs and benefits (e.g., remediation costs and reduced risk)" of the HRS SsI Addition. Furthermore, the commenter has not identified within this comment the specific parts of the scoring process which are not fully transparent or defensible. However, EPA has reviewed and responded to specific comments on the HRS SsI Addition, as appropriate, in this document. EPA considers it inappropriate to provide additional details on the inventory of sites identified in Appendix A of the proposal TSD for the HRS SsI Addition, as the agency does not want to raise erroneous perceptions of human health threats present at these sites. As described in the preamble to the promulgated HRS SsI Addition, the site inventory only identified sites with a potential subsurface intrusion threat. These sites were not used in the development of the HRS SsI Addition, but instead served as the basis for initially assessing the subsurface intrusion problem in general and provided support for the necessity of the rulemaking. Regarding the commenter's request for additional details on the analysis of costs from added VI sites, the regulatory impact analysis (RIA) conducted in support of the rulemaking (see the final RIA in the docket for this rulemaking) provides an appropriate estimation of the costs associated with implementing the SsI component. Additionally, EPA notes that the commenter has not identified in its comment the specific parts of the scoring process it would suggest be modified. However, EPA has reviewed and responded to comments provided during the public comment period and modified the HRS SsI Addition as appropriate.* *Regarding the commenter's concern that EPA would re-evaluate previously scored federal sites that were not previously added to the NPL, EPA does not plan to initiate a comprehensive program to re-evaluate non-NPL sites to determine whether they would now be eligible for placement*

Comment	Response
for federal agencies, the regulatory impact analysis still maintains, "The proposed rule does not impose direct economic or cost impacts on any private entity." DoD requests EPA appropriately evaluate the property value effects and enhanced compliance burden expected at Formerly Used Defense Sites (FUDS) and properties transferred under Base Realignment and Closure (BRAC). Many formerly DoD owned properties are now owned by local governments, nonprofits or private companies; however, DoD may retain the environmental liabilities. DoD requests EPA evaluate the cost of compliance and loss of property value for those entities; which are costs they may seek to recover from DoD.	*on the NPL. Furthermore, promulgation of this HRS SsI Addition has no impact on EPA's procedures for identifying sites for evaluation or re-evaluation using the HRS. Therefore, sites not on the NPL, whether under the jurisdiction of federal agencies or not, may need to be re-evaluated for the NPL using the amended HRS in the future if new information, or consideration of the SsI threat or any other threat, indicates the overall threat posed by the release at the site may be unacceptable. For example, conditions at sites may change over time and new information or changes in science could identify the need for further investigation at a site and perhaps the need for response action. Therefore, just as for other situations when new information becomes available for any site, if an EPA region, state, tribe or other federal agency determines it is appropriate to re-evaluate a site, or change its priority for further action, it can do so using its existing or future budget resources. EPA also works in consultation with the lead agency at a site, be it state, tribal, or federal, to determine the appropriate steps to re-evaluate such sites.* *Regarding the commenter's statement that the rulemaking's RIA should consider the economic cost associated with regulatory compliance costs and reduced property values at sites placed on the NPL and for Formerly Used Defense Sites and properties transferred to other entities under the Base Realignment and Closure program, EPA continues to assert that considering the impacts of these costs in the RIA would be inappropriate. The agency acknowledges there are perceived indirect costs resulting from placing sites on the NPL; however, these perceived costs result from the releases of hazardous substances. Costs are limited to screening relevant sites for subsurface intrusion contamination during site inspections and the resulting HRS evaluation and documentation record preparation. Furthermore, this rulemaking, which could lead to the placement of a site on the NPL that did not qualify for the NPL previously, does not itself impose any costs on outside parties; it does not establish that response actions will necessarily be undertaken, nor does it determine liability for site response costs.* *Additionally, EPA notes that costs arising from site remedial responses are the result of site-specific decisions made post-listing, and do not arise from the act of listing itself. Later decisions that consider information collected for HRS purposes could separately have specific economic costs and benefits (e.g., remediation costs and reduced risk), but these impacts are contingent upon a series of separate and sequential actions after listing a site on the NPL. Therefore, the addition of subsurface intrusion to the HRS is several regulatory steps removed from imposing costs on potential entities.* *EPA also notes that the HRS SsI Addition does not change the current authorities EPA and other federal agencies have in place for addressing releases or threatened releases of hazardous substances under CERCLA. Federal agencies currently address subsurface intrusion issues as part of their environmental programs and authorities. Executive Order 12580 [sec. 2. (e)(1)] delegates broad CERCLA authority to federal agencies for responding to actual and potential releases of hazardous substances where a release is either on, or the sole source of the release is from, any facility or vessel under the jurisdiction, custody, or control of the federal agency. Federal agencies are required to exercise this authority consistent with the requirements of CERCLA section 120, as amended, and implement regulations under the NCP, for both NPL and non-NPL sites. Therefore, as the commenter noted, if a federal agency retains responsibility for environmental contamination issues at a previously transferred property, EPA expects that agency would continue addressing contamination issues using authority under CERCLA and Executive Order 12580, and would be managing cleanup consistent with CERCLA. Therefore, EPA would not expect to pursue placing such a site on the NPL and any costs incurred would not be due to the HRS SsI Addition.*
EPA Policy Language: The site inspection usually includes the collection of samples for chemical analysis. Such samples aid in ascertaining what substances are present at the site and whether they are being released. **Proposed Revision / Comment:** While it is standard to collect groundwater and soil samples during an SI, the detailed vapor intrusion assessment, including indoor air, subslab, and background air sampling, would be required during the SI if the SsI pathway is to be included in the HRS score. This would significantly expand current SI activities and costs.	*The commenter may have misinterpreted the sampling requirements for performing an HRS evaluation using the SsI component and how the HRS is used to identify sites for the NPL. The SsI component does not require all types of samples (e.g., ground water, soil, soil vapor, subslab, and indoor air) to be collected at every site, nor does it specify any specific sampling media must be collected. The SsI component has been designed to utilize data from all types of samples, although EPA acknowledges indoor air samples would likely be collected during a site inspection being performed to collect SsI data, as indoor air is the primary type of sample that can be used to establish an observed exposure to subsurface intrusion. Additionally, EPA considers the extent of the sampling required to perform an HRS SsI component evaluation to be similar to that required for evaluating sites using other HRS pathways and is within the scope of a time-limited screening assessment. For example, the number of samples necessary to determine the areas of subsurface contamination or areas of observed contamination is expected to be roughly equivalent to that for establishing areas of soil contamination at a comparable size site evaluated under the Soil Exposure component. However, EPA agrees that in some cases the scope of a typical SI may need to be expanded to collect the information necessary to evaluate the SsI threat present at a site or that an ESI to fill data gaps may be needed. Although, as is the case with the other HRS pathways, the level of effort required to evaluate a site already varies on a site-by-site basis depending on the size and extent of contamination at the site. Therefore, it cannot be predicted with certainty that there will be an overall increase in cost or level of effort for any particular site due to the HRS SsI Addition. EPA notes that information on source*

Comment	Response
	strength could always be used in establishing attribution of indoor contamination to subsurface intrusion but is not required and therefore costs associated with gathering this type of data are not necessarily factored into the costs associated with a limited site assessment.
EPA Policy Language: An HRS score is obtained by evaluating a set of factors that characterize the potential of the release to cause harm via that pathway. **Proposed Revision / Comment:** Detailed evaluation of the proposed SsI HRS scoring indicates that the system presumes the set of factors referenced and the scoring schema and values proposed appropriately characterize VI potential. It does not appear this is technically defensible nor consistent with the EPA June 2015 final VI and PVI guidance documents. For example, EPA initially proposed a relatively prescriptive decision schema in their draft 2002 VI guidance for assessing VI; however, the final EPA VI guidance repeatedly acknowledges that multiple lines of evidence (MLE) are necessary, the importance of understanding a site and building's conceptual site model (CSM), and the need to consider various uncertainties (e.g., building characteristics, spatial/temporal variability, background contributions and strength of evidence in assessing the source of the vapors) when prioritizing or assessing VI potential. More discussion of these uncertainties and their impact on mistakenly including or excluding a site due to VI potential should be added to the TSD, along with additional testing of the scoring system using a broader range of site conditions. Consideration should also be given to incorporating the factors or methods that have emerged in the last decade for prioritizing or assessing VI and that have been discussed in the EPA final VI and PVI guidance documents. In the FAQs, EPA describes HRS as a screening tool and that the HRS must be consistent with the initial methodology developed in 1981 and last revised in 1990. Therefore EPA values consistency with the 1990 scheme over the state-of-the-science highlighted in their 2015 VI guide and contend the HRS and VI Guide are for different processes and applied at different times. DoD believes defensible VI science should underlie and support effective screening for both HRS scoring and VI assessments conducted using the EPA VI guide. DoD recommends that EPA adapt an approach to NPL listing for SsI that better accounts for the strength of multiple lines of evidence, and the degree of the hazard (e.g., accounting for the magnitude of subsurface source strength; see attached pdf for recommended solution, redline edits, and DoD Test Site examples).	*EPA disagrees with the commenter's assertions that the SsI component does not provide a technically defensible approach to evaluating sites with subsurface intrusion threats and that the SsI component's scoring methodology does not appropriately characterize the vapor intrusion potential. However, EPA has reviewed and responded to comments provided during the public comment period, as shown throughout the responses to comments provided in support of promulgation of the rulemaking. In general, the commenter's criticisms are due to the assumptions that an HRS site score is meant to be a ranking amongst sites based on a site-specific risk assessment and that its ranking should only be considered accurate if sites placed on the NPL are found to be in need of remedial action due to unacceptable risk. However, placement of a site on the NPL only indicates that EPA has determined it to be a priority for further investigation to determine if it poses an unacceptable risk. The HRS evaluation process can be considered successful if the majority of sites placed on the NPL are determined, based on further investigation, to be associated with unacceptable risk. It is not a failure if some sites placed on the NPL are not found to have unacceptable risks (i.e., a false positive), especially if further investigation was necessary to make this determination. Consistent with the role of EPA to be protective of human health and the environment, EPA would rather have a few false positives than multiple false negatives.* *Regarding the commenter's statements that the method for prioritizing sites using the SsI component is inconsistent with EPA's VI and PVI guidances, the purpose of these guidance documents is to address the investigation and assessment of the site-specific threats posed by vapor intrusion into structures from all sources under all EPA OLEM programs, particularly for determining the need for response actions and particularly actions taken under CERCLA and RCRA. The HRS is a screening tool using very limited sampling data to determine if a site is eligible for placement on the NPL, which is a determination that a site is likely to pose sufficient risk relative to other sites evaluated to warrant further investigation and potentially remedial action under CERCLA. The HRS is not used in making risk management decisions whereas the EPA VI and PVI guidances are used to determine based on representative site-specific data if an unacceptable risk is present at individual sites and if remediation is necessary. Consequently, because of these differences, the methodology and decision criteria used in an HRS evaluation may not always be consistent with approaches identified in the EPA VI and PVI guidances. However, EPA does note that EPA's VI guidance identifies many principles, sampling procedures, and other concepts that may be appropriate for use in evaluating the SsI component (e.g., data collection, sample collection).* *Regarding the commenter's request that additional discussion of the various uncertainties that may be present at a site with subsurface intrusion, and the potential to mistakenly include or exclude a site from eligibility for placement on the NPL due to the uncertainties, be added to the rulemaking's technical support document (TSD), the agency considers that additional discussion is not warranted. EPA considers that the TSD for the proposed and promulgated HRS SsI Addition provides sufficient discussion of the options considered and selected in development of the SsI component. EPA also notes that uncertainties exist in the other HRS pathways as well. For example, variation in the occurrence of releases is no greater in the SsI component than would be expected in point-source air releases or spills to surface water. The HRS is a screening tool to determine if more evaluation at a site is warranted. It is not intended to result in a thorough and comprehensive evaluation of the scope of the hazardous waste contamination at a site, the fate and transport of said contamination, or the explicit threat to human and environmental health. Consideration of the variation in release rates is subject to further evaluation during remedial investigations. However, EPA notes that further discussion of potential variables that could impact an SsI component are appropriate topics for any future guidance documents developed to support implementation of this rulemaking.* *Regarding the commenter's suggestion that additional testing of the SsI component's scoring methodology should be conducted over a "broader range of site conditions," the agency considers that sufficient testing has been conducted during development of the SsI component. As discussed in the HRS SsI Addition preamble at promulgation in Section III.C, Testing the SsI component, the SsI component was tested extensively throughout development. This testing ensured that the SsI component did not impact the relative contribution to the HRS site score provided by all HRS pathways and components, ensured that the level of relative risk necessary to qualify a site for placement on the NPL (e.g., number of receptors subject to actual contamination needed to achieve a site score of 28.50 or greater) remained consistent across pathways, and that the use of the SsI component would not "underscore" (underestimate relative risk) or "overscore" (overestimate relative risk) sites. As part of this testing, extensive sensitivity analyses were performed of the SsI component to test the rule and identify and assign the relative magnitude of the factors having the greatest impact on the HRS site score. (Please see Appendix A: Conceptual Site Model/Sensitivity Analysis of the TSD for the final rulemaking for*

Comment	Response
	additional information on this topic.) To support this rulemaking, the agency also identified 11 sites (i.e., Tier 1 or Test Sites) suitable for testing the SsI component evaluation process. These 11 sites had documentation of indoor air contamination due to subsurface intrusion based on actual sampling data and other typically HRS-required data. It was unknown whether these sites would qualify for the NPL when they were chosen as Test Sites, as the SsI scoring process had not been developed. The Test Sites were not randomly chosen; they were specifically selected because they have documented subsurface intrusion threats and sufficient available data to test all parts of the SsI component. (Please see Appendix B: Site Summaries and Scoring Information for Test Sites [Tier 1] for additional information on this topic.) *Regarding the commenter's statement that EPA values consistency with the 1990 HRS over the state-of-the-science for vapor intrusion, if the commenter is implying that the conceptual site model that the HRS is based on is no longer scientifically valid or is out of date, EPA disagrees with that assertion. EPA notes that the commenter has not provided either rationale or documentation that demonstrates the HRS concept or structure is out-of-date or not representative of state-of-the-science. While the commenter suggests that the state of the science is represented in the 2015 VI Guide, EPA notes that the 2015 VI guidance document uses information obtained from investigations beyond the scope of an SI or ESI (i.e., data available at the time of HRS evaluation). Therefore, the state-of-science as presented in the 2015 VI guidance document is not necessarily applicable to an HRS evaluation.* *Regarding the commenter's suggestion that the SsI component be adapted to better account for the strength of multiple lines-of-evidence and the degree of the potential human health threat (e.g., consideration of source strength), the SsI component has been revised since proposal to further reflect the magnitude of subsurface or indoor air contaminant concentrations when information that can be obtained during a time-limited screening assessment. For example, an SsI component score will now be higher if non-aqueous phase liquids (NAPLs) are identified as present during a time-limited screening assessment. Specifically, the assignment of a degradation factor value (see HRS Section 5.2.1.2.1.2, Degradation) and the weighting factors for targets within an area of subsurface contamination (see HRS Table 5-21) have been revised to include additional consideration of source strength (e.g., concentration of a hazardous substance present in the subsurface); specifically in the situation where NAPLs are present.*
EPA Policy Language: An HRS score is obtained by evaluating a set of factors that characterize the potential of the release to cause harm via that pathway. **Proposed Revision / Comment:** The magnitude of subsurface or indoor air VOC concentrations (i.e., source strength) should be a consideration when scoring a site, so both industrial and residential sites with relatively high subsurface or indoor air source strengths are not scored similarly to those with very low source strengths (refer to the supporting DoD Test Site examples). The technical support document explains that temporal variability in indoor concentrations, and the limited amount of data available from a PA/SI, are the reasons that the proposed rule does not treat an observed indoor concentration 1000 times higher than the screening level any differently than an indoor concentration at or just above the screening level. DoD recommends EPA provide a provision to allow a building with detectable impacts to be removed from HRS scoring if it can be demonstrated that the reasonable maximum exposure is below screening levels or has been considered to be acceptable. Currently, the HRS scores high even when EPA has concluded that the degree of vapor intrusion at a property does not pose a significant threat to human health and the environment, yet the property still would be "polluted badly enough to qualify for superfund" under HRS. This significantly impacts DoD costs when HRS results in false positive HRS scores.	*EPA disagrees with the commenter's assertion that the SsI component needs to further consider the magnitude of the concentration of volatile organic compounds found in the subsurface or in indoor air. The SsI component allows consideration of the magnitude of subsurface or indoor air concentrations where information that is available at the time of the HRS evaluation. For example, an SsI component score will be higher if hazardous substances are present as NAPLs (which are indicative of high source strength) or if an indoor air sample concentration is found to be above a health-based benchmark during a time-limited screening assessment. EPA notes that the assignment of a degradation factor value (see HRS Section 5.2.1.2.1.2, Degradation, of the HRS) and the weighting factors for targets within an area of subsurface contamination (see HRS Table 5-21, Weighting Factor Values for Populations Within an Area of Subsurface Contamination, of the HRS) have been revised since proposal of this final rule to include additional consideration of source strength (e.g., concentration of a hazardous substance present in the subsurface); specifically in the situation where NAPLs are present.* *EPA notes that the HRS, for all pathways and components, incorporates concentration data in three factors: 1) Likelihood of release/likelihood of exposure (concentration data can be used to establish an observed release or observed exposure); 2) hazardous waste quantity (e.g., concentration data, if sufficient data is available, can be used for calculating hazardous constituent quantity, i.e., in performing Tier A estimates); and 3) targets (e.g., concentrations of hazardous substances present in an indoor air or subsurface sample can be used to determine weightings for populations in an area of observed exposure [AOE] or ASC).* *Furthermore, due to the large spatial and temporal variability in contaminant concentrations, it is beyond the scope of a screening tool in most situations to adequately estimate the actual degree of exposure over time resulting from subsurface intrusion. Therefore, it is not known whether an indoor air sample actually contains a hazardous substance one thousand times higher than a health-based benchmark based on data available during a time-limited screening assessment. Whether a site is several times above a cutoff or not, as long as it is at or above the cutoff, it is considered to pose sufficient threat to warrant further investigation. The HRS is a screening tool to gauge the relative risk posed by contamination at evaluated sites; an HRS evaluation is not a site-specific risk assessment. As noted in the conference report for the Superfund Amendments and Reauthorization Act of 1986 (SARA), the HRS need not meet the requirements of a risk assessment: "This standard does not, however, require the Hazard Ranking System to be equivalent to detailed risk assessments, quantitative or qualitative, such as might be*

Comment	Response
	performed as part of remedial actions…Neither the revised Hazard Ranking System required by this section nor any other provision of law or regulation requires the conduct of risk assessments at unlisted or listed facilities." (House Conference Report No. 99-962, 99th Cong. 2nd Sess. at 199-200, (1986)). *Based only on the limited data obtained from an SI and ESI, EPA cannot agree that data would be available at all sites during an HRS evaluation to document that a human health threat would not exist for a structure with "detectable impacts" from subsurface intrusion. If by "detectable impacts" the commenter means an observed exposure that does not exceed a health-based benchmark (i.e., a Level II exposure), the information, such as the variability of the intrusion rate and the contaminant strength in a regularly occupied structure to determine actual site-specific risk will not normally be available until later in the remedial site assessment process (i.e., after an RI has been completed). For HRS purposes, populations exposed to Level II concentrations represent a possible human health threat that may warrant further investigation. However, in the scenario where such data may be available during an HRS evaluation, EPA acknowledges that information of sufficient certainty that shows no unacceptable risk is, or will be, present in a regularly occupied structure could be considered in the SsI component, by eliminating the structure from the scoring process.*
EPA Policy Language: An HRS score is obtained by evaluating a set of factors that characterize the potential of the release to cause harm via that pathway. *[The commenter has referenced language that appears in Section IV.B., but has referred to Section IV.B.2]* **Proposed Revision / Comment:** The process needs to clarify when and how much indoor air data below health-based exceedances are needed to support a lower HRS score. As noted in the DoD Test Site examples, an industrial site with an indoor air concentration below the health-based screening level scores the same as a site with orders of magnitude higher indoor air concentrations.	*EPA disagrees that the SsI component needs to contain specific criteria for when, and how much, indoor air data below health-based exceedances would be needed to support a lower HRS score. EPA considers conditions at specific sites to be too variable to cover all situations that might be encountered. This is the same reason that the HRS does not provide prescriptive methods for performing site investigations for any HRS pathway evaluation. Prescriptive methods that would be applicable and usable during the collection and analysis of environmental samples depend on site-specific conditions, and a regulation could not be written to cover all possible situations, and could become outdated in the future as advances in science occur. However, EPA notes that issues related to the characterization and evaluation of indoor air contaminant concentrations using the SsI component is an appropriate topic to be addressed in any future guidance documents developed by EPA to support the implementation of the SsI component.* *Furthermore, due to the large spatial and temporal variability in contaminant concentrations, of possibly several orders of magnitude, it is beyond the scope of a screening tool to accurately estimate the actual degree of exposure over time resulting from subsurface intrusion of contamination based solely on data available during a time-limited screening assessment. Therefore, it is not an error in the HRS that two sites may score approximately the same if the contaminant levels at the sites are within a typical range of variation. However, a high contaminant level can be considered indicative of a need for an ESI sampling effort if the site score is not already above that necessary to qualify the site for the NPL to determine if the contaminant concentrations can be measured above benchmarks under different conditions.* *Furthermore, the HRS is a screening tool, not a site-specific risk assessment, and as noted in the conference report for SARA, need not meet the requirements of a risk assessment: "This standard does not, however, require the Hazard Ranking System to be equivalent to detailed risk assessments, quantitative or qualitative, such as might be performed as part of remedial actions…Neither the revised Hazard Ranking System required by this section nor any other provision of law or regulation requires the conduct of risk assessments at unlisted or listed facilities." (House Conference Report No. 99-962, 99th Cong. 2nd Sess. at 199-200, (1986)).*
EPA Policy Language: The soil exposure component score is added to the subsurface intrusion component score to determine the pathway score. The two component scores are proposed to be additive because the populations may be subjected to exposures via both routes: the soil exposure component reflects exposures to people when outside a structure and focuses on ingestion and the subsurface intrusion component reflects exposures inside a structure and focuses on inhalation. Hence, the addition of the two component scores reflects the potential cumulative risk of multiple exposure routes and is not double counting the relative risk. **Proposed Revision / Comment:** Although it is true that a receptor could be exposed via direct contact with soil and through the subsurface VI pathway, the relative contributions of risk cannot be assessed given the technical questions/limitations with the proposed additional SsI and scoring. The relative contributions to the overall risk from subsurface VI, soil exposure, and/or the other pathways cannot be assessed without revising the SsI scoring process to be based on current VI best	*EPA disagrees with the commenter's statement that the relative contributions of the SsI component to a site's HRS site score cannot be assessed due to technical questions/limitations associated with the component. The HRS does not evaluate site-specific risk, it only identifies sites for prioritization for further investigation to determine if a site poses an unacceptable risk. EPA bases the prioritization on site characteristics that can be obtained during a time-limited screening assessment at all sites being considered.* *Regarding the combining of the SsI component score with the soil exposure component score, EPA agrees that while summing the soil exposure and SsI component scores reflects that there is cumulative risk, an HRS site score is not a quantitative analysis of site-specific risk. The summing of the component scores only reflects that a site with both risks poses more threat than a site with one of the risks. Furthermore, the concept of cumulative risk is consistent with the HRS structure present in other pathways (e.g., the summing of threat scores in the overland/flood migration component of the surface water migration pathway). Therefore, EPA does not agree that additional analyses and revisions to the SsI component are required to effectively assess the potential cumulative risk from multiple exposure routes (i.e., the soil exposure and SsI components).* *Regarding the commenter's assertion that the relative contributions to a site's overall risk from various HRS pathways and components cannot be*

Comment	Response
practices and the EPA June 2015 final VI and PVI guidance. The addition of the VI and direct soil contact exposure components may not be "double counting;" however, the potential risks from one pathway or the other may be biased high or low, unfairly affecting the cumulative score. Additional analyses and revisions to the SsI scoring process are needed to effectively assess cumulative risks and relative contributions for each pathway prior to claiming additivity is appropriate/defensible.	*assessed without modifications to the SsI component to reflect current state of VI science and EPA's VI and PVI guidances, EPA notes that the SsI component and the PVI and VI guidances serve different purposes and support different phases of EPA's site remediation process. The HRS, unlike the PVI and VI guidances, is a screening tool based on the presence of very limited sampling data to determine if sites are eligible for placement on the NPL. The SsI component only identifies how to use data to perform a relative site ranking and is not intended to provide guidance on technical issues such as site-specific sampling procedures at potential sites. The purpose of the VI Guide is to guide the investigation and assessment of the threat posed by vapor intrusion into structures from all OLEM programs, particularly actions taken under CERCLA and RCRA. Therefore, the VI guidance may suggest collection of data that is beyond the scope of a time-limited screening assessment (i.e., the HRS) or identify decisions to be made when more extensive site -specific information is available. Consequently, because of these differences, an HRS evaluation may not always appear to be consistent with approaches identified in the VI guidance.*
EPA Policy Language: EPA is proposing to identify an area (or areas) of observed exposure at a site based on the location of regularly occupied structures with documented contamination resulting from subsurface intrusion attributable to the site being evaluated. The area encompassed by such structures constitutes the area of observed exposure (AOE). Other regularly occupied structures within this encompassed area (or areas) will also be considered in the AOE unless available information indicates otherwise. Populations occupying structures within the AOE are considered exposed to subsurface contamination for HRS scoring purposes, and thus, are included in the HRS evaluation. **Proposed Revision / Comment:** Scoring sites based on historic (e.g., PA/SI) data could be difficult and problematic. Structures not sampled within an AOE (defined by neighboring structures) can be assumed to be exposed to subsurface contamination for HRS scoring purposes, unless information indicates otherwise. The addition of more structures within an AOE would increase the Targets factor category score. The Targets factor category is not capped by a maximum value like the Likelihood of Exposure and Waste Characteristics categories and has the greatest impact on the total HRS score, so it is important that its score be as defensible as possible. This means that buildings without sampling data may require sampling to see if they need to be included in the AOE and a revision to the scoring process to better define and incorporate the magnitude of the detected concentrations. This calls into question the ability to perform SsI scoring with limited initial information. The data needs and complexity of the HRS conceptual model could make the SsI module difficult to use or defend. Additional discussion is needed to better define the data needs or usability/defensibility of existing data for SsI scoring based on the limited investigation and assessment methods typically used during a PA/SI process. Experience reflected in the EPA June 2015 final guidance, along with VI technical discussions and technical support documents from EPA during the last five years highlight the position they have taken since the 2002 draft VI guidance that predicting VI potential can be very challenging and require more data than are typically available at the PA/SI stage. In EPA's site example 008 an inference of exposure is drawn for 221 regularly occupied structures. EPA's guidance for site inspections discusses an expanded site inspection as typically having 30 samples (EPA/540- R-92-021, 1992). A recommended number of 30 samples may or may not be sufficient with 221 occupied structures, particularly if concurrent subslab, indoor, and outdoor air are needed to determine if VI is the source. Additionally, the amount of data required to accurately score a site like example 008 would not typically be available from even an expanded SI. Because vapor intrusion impacts are generally building specific and "patchy", it is overly conservative to assume that every structure within a boundary defined by observed detectable indoor concentrations is within the AOE. EPA could consider well-studied VI sites such as Endicott NY, Moffett Field CA (MEW Superfund Site), Redfield CO, Colorado DOT, Hill AFB, etc. to substantiate an estimation factor that at most 1/2 or 1/3 of structures in a diverse group of structures within the AOE will be significantly impacted. Note that each of these well-studied sites have occupied structures above a range of low-to-high subsurface source strengths. DoD recommends using a multiplier factor rather than assuming that every un-sampled structure is impacted.	*EPA agrees with the commenter that scoring sites based on historic data could potentially be difficult and problematic given that indoor air sampling, as well as crawl space and subslab sampling, has not been a regular component of site assessments under CERCLA. EPA expects that, when warranted, additional data may be collected to evaluate sites using the SsI component.* *Regarding comments on including structures without sampling data within an AOE, conducting indoor air sampling of all regularly occupied structures suspected to be experiencing vapor intrusion may or may not be necessary to determine if a site qualifies for placement on the NPL, depending on the number of structures in question. Sampling for HRS purposes need only determine if the HRS site score is at or above 28.50; sampling to document the exact site score above 28.50 is not required because the listing criteria has already been met.* *The inclusion of a regularly occupied structure within an AOE does assume vapor intrusion is most likely occurring into the inferred structure; however, it does not infer these populations are exposed to concentrations above health-based benchmarks. EPA considers it appropriate to rank on a relative scale those sites with a greater population in structures where intrusion has been demonstrated or inferred to likely be occurring than lesser populations at other sites. Further, EPA notes populations within structures inferred to be within an AOE are assigned a Level II weighting, which is one-tenth of the weighting assigned to populations documented to be exposed to contaminant concentrations above health-based benchmarks. The HRS is not a quantitative site-specific risk assessment. If the HRS scoring required sampling every regularly occupied structure a sufficient number of times to assure that all exposed receptors were accounted for, the scope of the sampling effort would be beyond that of a screening tool and more consistent with the scope of an RI. However, such extensive data is typically not available until after a site has been placed on the NPL, at which point a more intensive RI could be conducted at the site to obtain a more extensive investigation.* *Regarding the prediction of vapor intrusion into a regularly occupied structure, the SsI component does not assign a prediction of vapor intrusion potential. It assigns a component score based on either actual exposure contamination or the potential for exposure which is then used for the calculation of an overall HRS site score. The potential for exposure factor is based on concepts and factors impacting the likelihood of vapor intrusion occurring, but is not a quantitative prediction of the likelihood of vapor intrusion to occur at a specific structure. This score is then used to determine if further investigation of the site is warranted, at which time, the vapor intrusion potential would be fully evaluated, and not to determine based on this data alone that remediation is warranted.* *Regarding Test Site 008, SIs are tailored to each site and there are no statutory or regulatory limits on the scope or time period for an SI (see 300.420 (c) the NCP). Collection of 30 samples for an SI is a rough guideline for a typical site. EPA acknowledges an SI for an SsI component may require more sampling than is typically conducted for other pathways or components of the HRS. In the case of Test Site 008 the HRS evaluation was performed based on existing data that was not collected for the purpose of scoring the site using the SsI component. EPA considers it likely that an SI performed at this site for the purpose of scoring it using the SsI component would collect more than 30 samples.* *EPA also does not consider it appropriate to use an "estimation factor" or "multiplier factor" for projecting the number of regularly occupied structures within an AOE into which subsurface intrusion is occurring. Inferring structures to be within an AOE in the SsI component is deliberately conservative to be consistent with EPA's mission to protect human health and the environment. Employing the use of an "estimation factor" based on a small sample size of studies is not appropriate because it is unclear how such an estimation factor would be used to determine which structures are included in and excluded from the AOE and what site characteristics should be considered in determining the estimation factor to be used at sites with different site conditions.*

Comment	Response
EPA Policy Language: The first step is to determine whether contamination has entered a regularly occupied structure; if this has occurred, "observed exposure" is established. **Proposed Revision / Comment:** Consistent with previously submitted DoD comments, we believe it is unreasonable to expect that PA/SI level sampling can support this determination. Especially for vapor intrusion, there is a level of sophistication that is not likely to occur during a PA/SI; oversimplification of sampling and other techniques will likely lead to the inability to attribute detections of chemicals or to overestimate contributions because of unidentified indoor sources. It is unclear what will be included in an "expanded" SI until guidance is written. The techniques that EPA now agrees may be needed for attribution in the revised technical support document are more sophisticated and costly then EPA's historical definition of an "expanded" SI: • attempting to remove all household chemicals from sampled structure(s) • isotopic fingerprinting of substances • controlled pressure method Applying these method to dozens or even a hundred structures at a site is not consistent with EPA's description of the PA/SI in the federal register notice as "the initial studies, the preliminary assessment and site inspection, which are performed on a large number of sites, are relatively modest in scope and cost compared to the remedial investigations and feasibility studies subsequently performed on NPL sites." EPA is correct that temporal variability exists, but DoD contends it is not scientifically defensible or consistent with EPA guide to make a decision based simplistically on 1) detectable over background, 2) over screening limit and 3) not detectable over background. DoD does not think it is scientifically defensible to ignore the magnitude of the measured concentration above a screening level. Nor is it defensible to ignore the fact that background contributions (particularly in commercial/industrial buildings) are highly dependent on buildings- specific activities.	*EPA disagrees with the commenter's assertion that it is unreasonable to expect that PA/SI level sampling can support the SsI component score. The variability in subsurface intrusion is no more variable than for some other HRS pathways (e.g., spot air releases in the air migration pathway, spills to surface water in the surface water migration pathway, contaminant levels in all parts of large areas of contaminated soil in the soil exposure component). However, since variability is present at all sites being evaluated, it is unlikely that the impact of this variability will have a significant impact on the relative ranking among sites due to the inclusion of consideration of subsurface intrusion in the HRS. EPA agrees a complete characterization of the extent and representative concentrations at a site may not be possible for most sites at the stage in which an HRS evaluation is performed, in any pathway, but that is not the purpose of a SI. The purpose of an SI is to collect sufficient information during a time-limited site assessment to perform an HRS evaluation to identify priority sites for further investigation. EPA agrees there are some unique issues related to evaluating vapor intrusion; however, EPA notes that all HRS pathways and components are evaluated using limited data and similar assumptions. If a site is determined to warrant further investigation following an HRS evaluation and placement on the NPL then a remedial investigation can be performed, which includes a more comprehensive site-specific investigation of site contamination that collects sufficient information to perform a site-specific risk assessment.* *Regarding the comment on the scope of an ESI, the objective of an ESI is to fill data gaps that exist after an SI is conducted, and to provide further documentation for the HRS package to support NPL rulemaking. Specific topics for consideration during an ESI for the SsI component are an appropriate topic for any future guidance documents developed to support implementation of this rulemaking. As experience is gained using the SsI component, EPA will consider what topics are appropriate for inclusion in any future guidance. However, specific discussion regarding the topics included in any future guidance is outside the scope of this rulemaking.* *Regarding comments on establishing attribution, attribution of contamination to a site release is a required part of all HRS pathways, and is also problematic in identifying releases impacting all HRS pathways. EPA agrees that attribution may be difficult to document in some situations. However, the HRS evaluation shows that this requirement has been met by providing a reasoned explanation that has not been shown to be incorrect. The public has the opportunity to contest this explanation by commenting on the site listing proposed rule. This standard has been successfully achieved at least 1600 times for sites that have previously been placed on the NPL.* *Based on the description of the role of attribution in an HRS evaluation, the commenter may have misinterpreted all of the requirements for establishing observed exposure. No attribution decision is made based solely on the three scenarios listed by the commenter. HRS Section 2.3, Likelihood of Release, states "[t]he minimum standard to establish an observed release by chemical analysis is analytical evidence of a hazardous substance in the media significantly above the background level. Further, some portion of the release must be attributable to the site." The HRS accounts for situations where contaminant levels are high ubiquitously or due to multiple sources when scoring a site. An observed exposure cannot be established based solely on a significant increase in contaminant levels between observed release samples and background levels. It also requires establishment that at least part of the significant increase in the contaminant levels be due to subsurface intrusion. Therefore, if background indoor air concentrations are above health-based benchmarks, this situation will be considered in the establishment of the background level used to establish a significant increase above background levels. EPA notes the commenter omitted the situation where a sample concentration is significantly greater than background concentrations but less than the health-based benchmark.* *The three methods listed by the commenter for establishing attribution may be lines-of-evidence for establishing attribution of a release to a site, however, none are required. These methods are listed in the TSD as possible options to help establish attribution of the subsurface intrusion contamination to the site. EPA does not anticipate that such methods of establishing attribution at a site would be required at dozens or hundreds of regularly occupied structures at individual sites. EPA agrees performing indoor air sampling at hundreds of structures, and the techniques identified to help determine attribution at dozens or hundreds of structures would be beyond the scope of a PA/SI and ESI, and does not anticipate such a level of effort would commonly be performed.* *Regarding magnitudes of concentrations in observed exposure samples, EPA agrees the HRS does not consider the magnitude of a concentration above a health-based benchmark, only the magnitude of increase in contamination above the background level. That a health-based benchmark is exceeded in this situation is what is considered important for the purposes of the HRS. This is because sites with hazardous substance concentrations at or above a health-based benchmark represent a higher relative risk worthy of further investigation regardless of the magnitude of the concentration above the benchmark. A concentration slightly above a health-based benchmark and a concentration ten times above a health-based benchmark both represent an unacceptable risk to human health. Furthermore, EPA notes that should detected concentrations be high*

Comment	Response
	enough to represent an acute risk to human health, EPA can address these situations, such as the undertaking of an emergency removal action to address the acute problem. Furthermore, no other pathway or component of the HRS evaluates concentrations at different magnitudes above health-based benchmarks, therefore, it would be inconsistent for the SsI component to do so as such a situation does not represent a greater risk in an SsI evaluation than in other HRS pathway evaluations. *Regarding comments on background contributions, EPA agrees that background contributions in all structures can be highly dependent on building-specific activities as well as building configurations, therefore, these criteria are to be taken into consideration when planning and performing an SI to collect data for the SsI component. These considerations are appropriate topics for any future guidance for the implementation of the SsI component.*
EPA Policy Language: Consistent with other HRS pathways and components, likelihood of exposure is evaluated in two ways within the proposed subsurface intrusion component. **Proposed Revision / Comment:** The two steps described here [establishing an observed exposure or evaluating the potential for exposure] to assess the likelihood of exposure mandates collecting indoor air samples first, and if there is no "observed exposure," i.e., any indoor air concentrations above detection levels, then the next step is further evaluation to assess potential for exposure. This is in direct contradiction of many guidance documents that caution against sampling indoor air without conducting concurrent subslab and subsurface soil vapor sampling. This approach, if followed will result in a rush to conduct indoor air sampling that are costly, and cause unnecessary intrusions to private residences. While EPA can and should advocate rush to sampling where there is a likelihood of imminent public health risk, applying this protocol to the entire spectrum of sites undergoing the PA/SI process will cause a lot of undue community concerns and interference in the lives of private citizens, not to mention additional costs and potential false negatives.	*Contrary to the commenter's expressed understanding, the SsI component does not mandate that indoor air sampling be performed first (or any specific type of sampling), and if no observed exposure is determined to then evaluate a potential for exposure (i.e., based on subsurface sampling). Not mandating the collection of any specific type of sampling enables the relative risk among sites to be characterized and prioritized for further investigation based on the limited data available during a time-limited screening assessment. Therefore, depending on site-specific conditions, indoor air samples are not required to be collected, but if collected, subsurface samples (e.g., ground water, soil gas) or indoor air samples can be collected separately or in conjunction with each other and in no specified order. EPA notes in many situations the agency would project that subsurface contamination existed under a structure before considering performing indoor air sampling.* *While the HRS does not mandate any specific sampling media, methods, or techniques, EPA considers it appropriate that at most sites being evaluated with the HRS SsI component both indoor air and subsurface sampling would occur during the same sampling event. Furthermore, if it is determined that after an initial sampling SI is completed and EPA determines that further sampling would likely result in sufficient data to support an HRS score qualifying the site for the NPL, EPA will consider performing an ESI to collect the necessary data to determine if the site score is at or above the NPL qualifying score (i.e., 28.50).* *A site does not undergo an SI and HRS scoring unless available information indicates there is a concern for human health and/or the environment. In the case of vapor intrusion EPA does not consider "interference in the lives of private citizens" to be a concern when the very reason for air sampling would be the protection of the health of citizens.*
EPA Policy Language: EPA is also proposing to give special consideration in two situations in which it is likely that exposure has occurred. One situation is when subsurface profiles may be impacted by channelized flow features, such as fractured bedrock or karst. The other situation is at locations where the contamination is measured directly below the structure. **Proposed Revision / Comment:** DoD agrees the process outlined in the rule should prioritize sites where the SsI evaluation should be expedited based on likelihood of exposure. The process should also eliminate sites from Ssl evaluation where there is little or no likelihood of exposure. A process flow chart should be developed to identify and evaluate sites for Ssl evaluation.	*The HRS is a screening tool used to evaluate the potential uncontrolled hazardous substances to cause human health problems or environmental damage at one site relative to other evaluated sites. The HRS does not identify a process for prioritizing sites to receive an HRS. Section II.B, Site Assessment and the Superfund Remedial Process, of the preamble to the promulgated HRS SsI Addition, identifies and describes the phases of EPA's site assessment process. During this process, if at any time EPA determines that sufficient information indicates a site poses no unacceptable risk, or if it can be addressed under alternative authorities it can be removed from the process. Figure 2, Site Assessment Process, of the preamble to the promulgated HRS SsI Addition, illustrates the site assessment process. EPA notes that a process flow chart showing the steps to identify appropriate sites for an HRS SsI evaluation and collect the data needed to conduct such an evaluation is an appropriate topic for any future guidance developed to support implementation of the SsI component.*
EPA Policy Language: Observed exposure by "chemical analysis" is established by comparing hazardous substance concentrations in background and release samples that have been chemically analyzed. The concentration of one or more hazardous substance(s) in one or more indoor air sample(s) taken from a regularly occupied structure (termed the "release sample") is compared to the concentration(s) at appropriate background locations and under appropriate background conditions. **Proposed Revision / Comment:** There are several issues with EPA's proposed approach, which raise questions about its reliability for developing SsI scores. Determining observed exposure by indoor air sampling runs into the problems of how to characterize	*While EPA agrees with the commenter that an SsI evaluation can be challenging due to variability in contaminant concentration levels and in site conditions, the variability in subsurface intrusion is no more variable than for some other pathways (e.g., spot air releases in the air migration pathway, spills to surface water in the surface water migration pathway, contaminant levels in large areas of contaminated soil in the soil exposure component). However, since variability is present at all sites being evaluated using the HRS, it is unlikely that the impact of this variability will have a significant impact on the relative ranking among sites. Furthermore, the HRS has no restrictions on the number of samples to be collected or the number or length of the sampling events; if it is determined that additional sampling might result in a substantially different HRS site score, EPA can perform an ESI to collect the additional data.* *Selecting appropriate background levels is accomplished similarly to the other HRS pathways and components in that the background samples should be from the same medium and outside the influence of contamination from the site, if possible. They should also account for local variability*

Comment	Response
exposures given the temporal variability observed in VI-impacted structures, how to select appropriate background levels, and how indoor sources of VOCs are addressed. The TSD acknowledges some of these problems, but does not confront how these uncertainties affect SsI scoring, nor does it provide instructions on the level of data needed to effectively score this pathway during the PA/SI stage.	*in concentrations and site conditions. Discussion of background sampling, establishing background concentration levels, and methods accounting for indoor air sources of hazardous substances are appropriate topics for discussion any future guidance developed for the HRS SsI Addition. However, EPA's VI guidance identifies many principles, sampling procedures, and other concepts that may be appropriate for use in evaluating the SsI component (e.g., data collection, sample collection).* *EPA is unclear on what the commenter means by "level of data." There is no set amount of data required for the SsI component, or any other HRS component or pathway. The amount of data needed to score a site is site-specific and the HRS does not establish the amount of data required for any site. Implementation of the SsI Addition and data collection for its scoring are possible topics for any future guidance, as such procedures may involve consideration of site-specific conditions or topics of ongoing research and development.*
EPA Policy Language: The concentration of one or more hazardous substance(s) in one or more indoor air sample(s) taken from a regularly occupied structure (termed the "release sample") is compared to the concentration(s) at appropriate background locations and under appropriate background conditions. If the chemical analyses document a significant increase over background levels and if at least part of the significant increase can be shown to be attributable to a release(s) from the site being evaluated, then observed exposure by chemical analysis has been documented. **Proposed Revision / Comment:** As noted previously and in other DoD comments, conducting very sophisticated and complex indoor air and ambient background air sampling to both attribute contamination and distinguish from other sources is beyond the scope of a typical PA/SI. It is common to have indoor background elevated over ambient with no VI: "Indoor concentrations of these 27 organic vapor HAPs [hazardous air pollutants] are generally 1 to 5 times outdoor concentrations" (EPA/600/N-98/002). EPA has prepared a good compilation of indoor air data for residences (EPA 530-R-10-001). There is little compilation of data for defining background for commercial/industrial structures. The available data for commercial structures is primarily only for office buildings and is very dated (data collected 1994-1996). In the absence of building-specific background source information, DoD continues to maintain that appropriately accounting for subsurface source strength (along with distance to the source) provides a more defensible indicator of VI potential versus the current HRS approach.	*Contrary to the commenter's assertion, conducting background and attribution air sampling is not beyond the scope of a typical PA/SI. Background samples are routinely collected during the SI stage for all sample media in all HRS pathways. Establishing background levels and attribution of significant increases in contaminant levels is a required part of all HRS pathways. The HRS evaluation must show the attribution requirement has been met by providing a reasoned explanation that has not been shown to be incorrect. There is no requirement for establishing attribution that a conclusive decision be reached based on a thorough and comprehensive investigation of the site, only that a reasoned explanation can be provided based on the data available at the time of scoring the site.* *In response to the cited quote (from EPA/600/N-98/002), procedures for establishing background levels of hazardous substances in regularly occupied structures are not addressed in this rulemaking. Indoor air samples used to establish an observed exposure are compared to background indoor air levels, not compared to outdoor ambient air levels. Therefore, that indoor air concentrations for certain substances are generally higher than outdoor concentrations is irrelevant to establishing significant increase in contaminant levels by chemical analysis. However, to establish observed exposure, EPA agrees that outdoor ambient air contamination levels are considered when establishing the attribution of the contamination to the site. EPA notes that in relation to establishing background levels for all HRS pathways, EPA's 1992 Interim Final Hazard Ranking System Guidance Manual does identify that area-wide background level studies are a source of information that can be used in establishing a site-specific background level. It is important, however, to consider if these area-wide values are representative of site-specific conditions.* *Regarding the commenter's assertion that appropriately accounting for subsurface source strength (along with distance to the source) provides a more defensible indicator of vapor intrusion potential versus the current HRS approach, subsurface source strength is irrelevant to establishing background concentrations for indoor air samples. Furthermore, the HRS does not allow for the estimation of concentration levels in establishing an observed release or observed exposure. The potential for exposure is only evaluated if no observed exposure (i.e., indoor air samples with concentrations of hazardous substances significantly above background) has been documented. Furthermore, the distance between a regularly occupied structure and the subsurface contamination is accounted for in the Potential for Exposure scoring (see section 5.2.1.1.2.2, Depth to contamination, of the HRS).*
EPA Policy Language: Background levels for this situation, in some cases, may be determined by chemical analysis of samples from similar environments collected from outside the area impacted by the release(s) from the site being evaluated. While the appropriate sample locations to be used to establish this background level will vary based on site-specific conditions, an appropriate background level needs to account for both outdoor air concentrations and indoor air concentrations in structures of similar construction type (e.g., basement, slab-on-grade) within the vicinity. **Proposed Revision / Comment:** This sets an unreasonable data quality objective for obtaining background levels in air at potential VI sites, involving collection of ambient (outdoor) air samples, in addition to indoor air samples in representative buildings unimpacted by the SsI pathway. With the variability typically observed with VOC concentration in air, multiple rounds of air samples are needed to draw a reliable site-specific background level in air for a VI assessment. This represents data typically collected later in the remedial response process, such as during an RI. If comparison with	*Regarding the commenter's assertion that the SsI approach sets an unreasonable data quality objective for obtaining background levels in air at potential SsI sites, the method for determining background concentrations at a site evaluated using the SsI component is consistent with the other components of the HRS.* *Regarding variability concerns, the variability in subsurface intrusion is no more variable than for other pathways (e.g., spot air releases in the air migration pathway, spills to surface water in the surface water migration pathway, contaminant levels in large areas of contaminated soil in the soil exposure component). Multiple rounds of indoor air samples for fully characterizing the variability in vapor intrusion is consistent with the level of effort of an RI, but beyond that of an SI or ESI. Moreover, the purpose of an SI or ESI is not to fully characterize contamination at a site. It is only to collect sufficient data to evaluate the site to determine if a further investigation of the site is required.* *Regarding the commenter's suggestion that EPA provide more workable guidelines for obtaining background data, this is discussion for any future guidance on implementing the SsI component.*

Comment	Response
background is a component of exposure identification, EPA should provide more workable guidelines for obtaining background data.	
EPA Policy Language: The first step in determining if observed exposure by chemical analysis has occurred is documenting that the magnitude of the difference between the background level concentration and the release sample concentration is sufficient to rule out the possibility that neither the difference nor the similarity is simply due to variation in site conditions and in the replicability and precision of the sampling and analytical procedures. The magnitude of this "significant increase" was established for all HRS pathways based on studies peer reviewed by the Science Advisory Board when the HRS was last revised in 1990. See section 2.6 of the 1988 Revised HRS TSD for supplemental information. **Proposed Revision / Comment:** This sets an unreasonable standard for ruling out the possibility that differences between site and background concentrations are due to variability in site conditions. Previous studies have documented significant temporal and spatial variability in exposure concentrations in indoor air at VI-impacted buildings. In its recently published VI guidance, EPA recommends that multiple rounds of indoor air samples are needed to characterize the variability in VI. While "significance difference" has been defined for purposes of HRS scoring, EPA should revisit this definition in light of the state of the science of VI research regarding temporal and spatial variability in indoor air.	*EPA disagrees that the SsI component sets an unreasonable standard for establishing background concentrations. Moreover, the method for establishing an observed release (ground water, air, and surface water migration pathways)/observed contamination (soil exposure component)/observed exposure (SsI component) is consistent across all components of the HRS, and, therefore, not unreasonable.* *The variability for subsurface intrusion is no more variable than for some other pathways (e.g., spot air releases in the air migration pathway, spills to surface water in the surface water migration pathway, contaminant levels in large areas of contaminated soil exposure component). Multiple rounds of indoor air samples for fully characterizing the variability in vapor intrusion is consistent with the level of effort of a remedial investigation, however, the purpose of an SI or ESI is not to fully characterize contamination at a site. It is only to collect enough data to evaluate the site to determine if a further investigation of the site is required. Furthermore, the SsI component and the EPA VI guidance addresses the threat posed by vapor intrusion and are based on the same scientific principles; however, these documents serve different purposes and support different phases of the Superfund remedial process and the decision criteria in each were is not designed to be, nor needs to be, consistent in all aspects. The purpose of the EPA's VI guidance is to guide the investigation and assessment of the threat posed by vapor intrusion into structures from all sources under all OLEM programs, particularly actions taken under CERCLA and RCRA. The HRS SsI Addition is an amendment to the NCP, under CERCLA to allow placements of sites on the NPL based on the threat individually posed by subsurface intrusion (both contaminated groundwater and vapor intrusion) or in combination with other contaminant migration and exposure routes. Placement of a site on the NPL is a required step to allow further investigation and remedial actions under CERCLA. The SsI component is not guidance and uses data collected from time-limited screening assessments to rank the relative threat posed by sites. The SsI component does not address such subjects as data collection and sampling procedures.* *In response to the commenter's request that EPA revisit the definition of "significance (sic) difference" in light of the state of the science of VI research regarding temporal and spatial variability in indoor air, EPA asserts it would result in inconsistencies between pathways if different criteria for establishing a significant increase in contaminant concentrations over background (i.e., an observed exposure) was established in the SsI component.*
EPA Policy Language: The second step in determining if observed exposure by chemical analysis has occurred is that at least part of the significant increase must be attributed to a release from the site being evaluated. . . . Therefore, it is critical that a significant increase in these hazardous substances be documented as coming from the subsurface and not simply emanating from these products. It is suggested that the evidence to support this determination include multiple lines of evidence, including determining outdoor air hazardous substance concentrations; finding the hazardous substance at the source facility, site, or release being investigated; and finding the hazardous substance in subsurface samples. **Proposed Revision / Comment:** This step places an unreasonable expectation regarding assessing contribution of indoor products and sources to concentrations detected in air during VI assessments. Identifying background contributions has proven to be one of the more challenging problems in VI assessments. Specialized investigation methods, including controlled building depressurization, and compound-specific isotope analysis have been developed, through research sponsored by DoD, to better evaluate the contribution of background sources to indoor concentrations. In addition, EPA mentions here using multiple lines of evidence for assessing the significance of background sources, a method that would be applied during a VI assessment conducted as part of an RI. Implementing this approach essentially involves performing comprehensive VI investigations during the pre-remedial PA/SI stage. EPA should revisit this proposed approach and redefine it in terms that are more suited to a pre-remedial scoring process. The techniques that EPA now agrees may be needed for attribution in the revised technical support document are	*Regarding the commenter's assertion that attribution places an unreasonable expectation on the SsI site assessment, attribution of contamination to a site release is required for all HRS pathways. Without attribution, a site cannot be listed; however, attribution can also be problematic for all HRS pathways. The HRS evaluation must show this requirement has been met by providing a reasoned explanation that has not been shown to be incorrect. The public also gets the opportunity to contest this explanation during the public comment period for proposed NPL sites. There is no requirement for establishing attribution that a conclusive decision be reached based on a thorough and comprehensive investigation of the site, only that a reasoned explanation can be provided based on the data available at the time of scoring the site. Furthermore, as is the case with the other HRS pathways, the level of effort required to evaluate a site already varies on a site-by-site basis, therefore, the level of effort to evaluate a site for the SsI component may be greater in some instances. This standard has been successfully achieved at least 1600 times for sites that have previously been placed on the NPL.* *EPA agrees the three options the commenter listed for establishing attribution may be ways to help establish attribution at a site, however, none are required. They are listed in the Technical Support Document as possible options to help establish attribution at sites where establishing attribution may not be straightforward.* *Regarding applying these methods to dozens or hundreds of sites, EPA does not anticipate that such methods of establishing attribution at a site would be required at dozens or hundreds of regularly occupied structures at one site. EPA agrees performing indoor air sampling at hundreds of regularly occupied structures, and the identified techniques identified to help determine attribution at dozens or hundreds of structures would be beyond the scope of a PA/SI and expanded SI, and does not anticipate such a level of effort would be performed.*

Comment	Response
more sophisticated and/or costly then EPA's historical definition of an "expanded" SI: • attempting to remove all household chemicals from sampled structure(s) • isotopic fingerprinting of substances • controlled pressure method Applying these method to dozens or even a hundred structures at a site is not consistent with EPA's description of the PA/SI in the federal register notice as "the initial studies, the preliminary assessment and site inspection, which are performed on a large number of sites, are relatively modest in scope and cost compared to the remedial investigations and feasibility studies subsequently performed on NPL sites."	
EPA Policy Language: In addition, actions should be taken to ensure that sources of the hazardous substances inside a structure (e.g., household chemicals) have been removed from the structure prior to sampling. Establishing attribution to the site in some situations, however, may be straightforward to document, such as when the hazardous substance is manmade, unique, and not used in consumer products and thus, there would be no need to follow all the steps identified above to establish attribution. EPA expects that future advancement in methods for establishing the source of indoor contamination will be helpful for drawing attribution conclusions. **Proposed Revision / Comment:** Attribution can be problematic because of site-specific conditions. Because these conditions can vary, and new methodology for determining the impact of indoor sources are evolving, when will EPA address appropriate methodologies for determining attribution?	*EPA agrees with the commenter that attribution can be problematic due to site-specific situations; this is true for all HRS pathways, the SsI component is no different in that regard. Section 5.2.1.1.1 of the HRS requires that "[s]ome portion of the significant increase above background must be attributable to the site." The HRS evaluation must show this requirement has been met by providing a reasoned explanation that has not been shown to be incorrect. The public can contest this explanation by submitting comments on the proposed site listing. The attribution requirement is an absolute. If indoor air contamination could not be attributable, at least in part, to subsurface contamination at the site then that regularly occupied structure would not be eligible for inclusion in the HRS evaluation of the site. EPA notes that establishing attribution in VI investigations is not a new concept. Vapor intrusion investigations have been ongoing for years. Hundreds, if not thousands, of VI investigations have been done across the country where subsurface attribution has been successfully established. It is not outside the scope of a time-limited screening assessment to acquire the data necessary to establish attribution.* *Discussion of methodologies for establishing attribution is an appropriate topic for any future guidance on the implementation of the SsI component.*
EPA Policy Language: When an observed exposure has not been established, EPA is proposing to evaluate the potential for exposure within structures located in the ASC using the subsurface intrusion component. . . . As depicted in Figure 6 below, this involves predicting the probability of exposure in area(s) of subsurface contamination based on structural containment features of the regularly occupied structure and the route characteristics in the subsurface, including hazardous substance physical and chemical properties and physical subsurface properties that influence the probability that intrusion is occurring. **Proposed Revision / Comment:** Several of the factors involved with evaluating potential exposures as described here require a more detailed understanding of the VI pathway than would be achieved through the limited investigation conducted as part of PA/SI. Examples of such factors includes identification of preferential pathways to structures, and understanding of the migration of volatile compounds through the vadose zone. For example, the issue of preferential pathways is especially critical. If preferential pathways are defined as… "Preferential subsurface intrusion pathways: Subsurface features such as animal burrows, cracks in walls, spaces around utility lines or drains through which a hazardous substance moves more easily into a regularly occupied structure", then because these are present at almost all buildings, it would be necessary to assume almost all buildings have preferential pathways. There was consensus at the 2016 EPA workshop that the focus needs to be placed on "atypical" preferential pathways, which generally directly connect the building to a strong source allowing for pressure driven flow. Since current screening criteria for subslab soil gas have been developed and validated based on buildings with the type of preferential pathways defined by EPA, they should be considered protective for a typical foundation. https://iavi.rti.org/attachments/WorkshopsAndConferences/15_Folkes_AEHS%20March%202016%20Folkes%20P	*EPA agrees with the commenter that a thorough evaluation of vapor intrusion, such as a comprehensive evaluation of preferential pathways, structure containment, and the migration of volatile compounds through the vadose zone can be complex and beyond the scope of a limited investigation. The HRS, however, is a screening tool designed to use limited data to determine the relative risk posed by a site compared to other sites evaluated. It is not a thorough evaluation of a site to determine site-specific risk. The SsI component does not attempt to provide a thorough site-specific assessment of these factors; rather it incorporates a general concept of these factors into the scoring process.* *Regarding preferential pathways, to determine the presence of atypical preferential pathways and their associated attenuation factors at a site is beyond the scope of an SI and ESI, and therefore, cannot be factored into the SsI component. Whether a preferential pathway is typical or atypical, it still represents a preferential pathway which is suitable for evaluation in the SsI component. To discuss and weight the potentially unlimited amount of site-specific conditions leading to preferential pathways would be out of place within the rule itself.* *EPA disagrees with the commenter's assertion that EPA needs to provide additional guidance on defining preferential pathways prior to promulgating the HRS SsI Addition. Discussion of evaluation of preferential pathways is an appropriate topic for any future guidance on the implementation of the SsI component. For additional discussion of the structure containment factor see Section 3.3.c, Weighting of Structure Containment Features, in the Final TSD for the promulgated HRS SsI Addition.*

Comment	Response
ref%20Path.pdf https://iavi.rti.org/attachments/WorkshopsAndConferences/11_Johnson%20_AEHS_2016.pdf Using preferential pathways as an example, the current HRS scoring process for structure containment is not defensible and EPA needs to provide additional guidance on defining preferential pathways prior to promulgating the HRS rule.	
EPA Policy Language: As is consistent with the current HRS, EPA is proposing containment factor values that range from zero to ten where a low containment factor value indicates a low chance for exposure. For example, in Table 5-12 of the proposed HRS addition, a structure with no visible open preferential pathways from the subsurface has a lower containment value than a structure with documented open preferential pathways because open preferential pathways (e.g., sumps, foundation cracks) represent a situation in which a greater probability for subsurface intrusion to occur is present. Supplemental information regarding containment and the factor values specified in Table 5- 12 is provided in section 4.0 of the Proposal TSD. **Proposed Revision / Comment:** Evidence from multiple recently-completed VI research projects, funded by DoD, suggests that preferential pathways significant to VI are not easily identified from the limited data collection performed as part of a PA/SI. Also, preferential pathways have been identified as a key uncertainty in assessing VI, and is a topic being addressed in upcoming DoD-sponsored studies. EPA should provide added discussion of how the data needs for assessing preferential pathways would be addressed for scoring purposes. EPA also should discuss in the TSD the uncertainties associated with preferential pathways, and revisit the containment factor values in Table 5-12 of the TSD, in light of the state of the science regarding preferential pathways.	*EPA disagrees with the commenter's assertion that EPA needs to provide additional discussion on defining preferential pathways prior to promulgating the HRS SsI Addition. Furthermore, the TSD is not guidance for the HRS nor is it intended to be a substitute for guidance, therefore, EPA disagrees further discussion of preferential pathways in the TSD is needed. See also the response provided to comment 34 for further discussion on this issue.*
EPA Policy Language: The depth to contamination factor represents the vertical distance between contamination (either in soil, soil gas, or surficial ground water) and the lowest horizontal point of an overlying regularly occupied structure (e.g., a basement floor). This distance represents how far a hazardous substance would have had to travel through the subsurface to intrude into that structure. Based on available data, the probability of exposure decreases as the depth to contamination increases. In addition, as part of EPA's sensitivity analysis in developing route characteristics, at depths greater than 150 feet it became increasingly unlikely that exposure would occur and this fact is reflected in Table 5-13 (section 5.2.1.1.2.2 of the Proposed HRS Addition). **Proposed Revision / Comment:** DoD requests a note on Figure 4-7 that it reflects an idealized case in which naphthalene is used, but assumed not to biodegrade at all. Otherwise the figure could lead the public to a poor understanding of naphthalene's actual behavior in the subsurface.	*The text associated with Figure 4-7 of the TSD for the proposed HRS SsI Addition (Figure 3-6, Potential for Exposure: Depth to Contamination Factor (Ground Water Plume), in the TSD for the promulgated HRS SsI Addition) identifies that this figure is presented to illustrate the relationship specifically between depth to contamination and the extent of physical attenuation of naphthalene as projected using a basic Johnson and Ettinger model. The Johnson and Ettinger model did not incorporate consideration of possible degradation of substances in soil gases and in ground water. The intent of this figure is not to provide an actual real-world depiction of the fate and transport of naphthalene based on all factors that could impact the actual concentration of naphthalene as it migrates from a depth into a regularly occupied structure. Therefore, no change was made to this figure or its discussion based on this comment.*
EPA Policy Language: The other situation is at locations where the contamination is measured directly below the structure (e.g., in subslab or enclosed/semi-enclosed crawl space samples). **Proposed Revision / Comment:** Per previous DoD comments, it is unlikely that subslab vapor samples will be collected during a PA/SI. The proposed rule remains unclear what will be included in an "expanded" SI. Significant subslab detections in the absence of measurable/detectable concentrations in indoor air can significantly (and inappropriately) increase the building's contribution to the site score. This occurs because "For any contamination found at a horizontal or vertical distance of five feet or less from a regularly occupied structure's foundation, EPA is proposing to assign a minimum weighting factor of 0.4 regardless of the sample medium." This emphasizes the need to consider source strength more explicitly in the HRS system and understand the potential for background to contribute to subslab	*The SsI component is designed to use subslab vapor sample data if available in performing the component evaluation, but does not require that subslab samples be collected to perform the evaluation. As noted in responding to earlier comments in this document, the HRS is a screening tool used to score a site based on limited data. The SsI component does not provide instructions or guidance for performing a PA, SI, or ESI, and thus, does not address obtaining the data to use for the SsI component or identify any particular sampling procedure. This is true of all HRS pathways. An ESI typically consists of a follow-up limited sampling event to an initial SI to help fill data gaps in the documentation for supporting placement on the NPL; the specific data collected in an ESI depends on site-specific factors.* *EPA disagrees that detection of hazardous substances in subslab vapor samples, but not in indoor air samples, may "inappropriately" increase the structure's contribution to the HRS site score. EPA considers the documentation of hazardous substances meeting observed release criteria found in samples within 5 feet of a structure foundation demonstrates that the contamination is more likely to enter into a structure via subsurface intrusion than when it is found at greater depths. Therefore, a higher weighting factor is assigned in this instance than for contamination found at greater depths. Similarly, the factor is lower than that assigned when the contamination is found in a crawl space under a regularly occupied structure or when it has been found intruding into a structure. (EPA notes this same concept was put forth by the commenter in its suggestions elsewhere in its*

Comment	Response
concentrations for buildings not affected by subsurface contamination.	*comments to use attenuation rates to assign the weighting factors.)* *EPA disagrees with the commenter's assertion that source strength should be further considered in the Potential for Exposure evaluation. EPA acknowledges the possibility that contaminants in indoor air could migrate to the subslab environs. However, if it was demonstrated that the measured subslab contamination was coming from within the structure and was not from subsurface intrusion, the data would not be used in the site evaluation as the sample results would not meet the attribution criteria. Hazardous substance concentrations in samples used to assign the weighting for populations within an ASC must meet observed release criteria, including attribution of the increase in concentration of the hazardous substance to be considered due to, at least in part, subsurface intrusion.*
EPA Policy Language: Because many of the site-specific characteristics impacting the rate of biodegradation are considered beyond the scope of a typical site investigation, EPA is proposing to evaluate biodegradation based on the substance being evaluated and if appropriate environmental conditions are present to ensure that sufficient biodegradation will occur to diminish the threat. **Proposed Revision / Comment:** Based on the current half-life values provided in the Superfund Chemical Data Matrix (SCDM), vinyl chloride does not meet the proposed degradation criteria and will be assigned a degradation factor of 1.0 regardless of depth to contamination (assuming no observed exposure). This contradicts years of field experience that suggests that vinyl chloride will aerobically degrade in the subsurface. DoD recommends EPA consider the half-life criteria be expanded to include substances like vinyl chloride or update the SCDM accordingly. DoD research indicates that vinyl chloride has not resulted in significant vapor intrusion for nonresidential buildings (http://www.nesdi.navy.mil/Files/FinalReports/FR_476.pdf). Vinyl chloride will frequently be the driver using the current EPA HRS process since it has a toxicity/degradation factor of 10,000 vs TCE at 1,000. This distorts the relative ranking provided by HRS between sites and pathways and prevents effective use of HRS for prioritizing high risk sites.	*EPA considers the half-life for vinyl chloride identified at proposal of the SsI component to be appropriate. EPA performed a limited review of data in the references cited by the commenter, pertaining to the half-life of vinyl chloride, and found that the half-life in the interim list appears to be in the lower range of observed half-lives for vinyl chloride. Therefore, the use of this value would be consistent with EPA's mandate to be protective of human health. A list of chemical factor values for use in HRS scoring evaluations will be made available by EPA following promulgation of the SsI component.* *In addition, EPA notes that the SsI component contains procedures for assigning degradation factor values for substances, not the actual half-lives used to determine the degradation factor values.*
EPA Policy Language: EPA seeks public input on the following question regarding the degradation factor: Is there a way to determine the presence and extent of biologically active soil at a site during a limited site investigation? If so, what soil characteristics should EPA consider to determine whether biologically active soil is documented to be present? **Proposed Revision / Comment:** The technical basis for the EPA tabulated biodegradation half lives faster than 100 days (and thus affected by the degradation factor) is presumably in most or all cases aerobic biodegradation. Most vadose zone soils that are not grossly impacted are considered "biologically active" in the absence of certain precluding factors by ITRC and EPA. [See: ITRC (2014), "Petroleum Vapor Intrusion Fundamentals of Screening, Investigation, and Management" and EPA's Petroleum Vapor Intrusion Technical Guide (2015) EPA 510-R-15-001]. Techniques of visual logging of moisture and field soil gas oxygen surveys are reasonable components of a limited site investigation and can provide valuable additional information on zones where aerobic degradation is probable. Information from the USDA Web Soil Survey is freely available for most of the nation at a very fine spatial resolution http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm. This data typically includes whether the soils are water saturated. It might also be possible to use the land capability classifications of soils in the web soil survey to determine whether soils are reasonably amenable to biodegradation. The original purpose of the land capability classification is to determine if the soils are suitable for crops or pastures. However since microbiological processes are key to agricultural productivity this is correlated to biodegradation. Capability subclass "w" is used for poorly drained or high water table soils where aerobic processes may be limited. The web soil survey also includes	*After evaluating the comments received on EPA's public question regarding biologically active soil, EPA has modified the final rule to clarify that the SsI component assumes the presence of biologically active soil to a depth of 10 feet below ground surface at all sites, unless information indicates otherwise. EPA agrees that soil moisture, oxygen levels, and pH are factors that can be used to indicate the presence or absence of biologically active soil. However, because these soil properties can vary temporally and spatially, and because the field screening investigations used to obtain site information are of limited extent and duration, data obtained during a site inspection may not represent long-term conditions. While soil databases, such as the USDA databased referenced in the comment may contain some of this information, they also may not have property-specific current soil data, especially in urban and industrial areas with disturbed soils. However, these sources of information could prove useful in indicting locations where there may not be biologically active soil, and their use for this purpose is a possible topic for future guidance.* *EPA appreciates the commenter's suggestions on determining whether soil at a site could be demonstrated to be biologically active.* *Regarding petroleum products, per the CERCLA definition of a hazardous substance, it "…does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under subparagraphs (A) through (F) of this paragraph, and the term does not include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas)." Therefore, benzene, xylene, and ethyl benzene could be evaluated as a hazardous substance during an HRS evaluation if they are attributed to purified solvents.* *Regarding the issues surrounding tabulated biodegradation half-lives faster than 100 days, EPA is planning to consider half-lives based on both aerobic and anaerobic biodegradation rates as it develops degradation factor values for individual hazardous substances.* *EPA does not dispute that the commenter's experience is that vinyl chloride may biodegrade prior to vapor intrusion. However, the fact that vinyl chloride vapors have been known to intrude into structures indicates it still can represent a threat to human health. Furthermore, EPA performed a*

Comment	Response
information on soil pH (under soils properties and qualities, soil chemical properties) that could be used to screen for extreme pH conditions that would not be conducive to diverse microbial community. Because petroleum products are specifically exempted from CERCLA many of the most rapidly biodegradable compounds are less commonly coming into consideration in HRS. https://www.epa.gov/sites/production/files/2013-09/documents/petro-exclu-mem.pdf. However the biodegradation factor does presumably apply to benzene, xylene, ethylbenzene when they were used as purified solvents. (http://ir.lawnet.fordham.edu/cgi/viewcontent.cgi?article=1357&context=elr). The biodegradation factor would also apply according to the newly released "Interim Subsurface Intrusion SCDM Values for Eligible Substances" to naphthalene, cis-dichloroethylene, methylene chloride and 1,1,2,2- Tetrachloroethane. As noted elsewhere the 171 day stated half life for vinyl chloride makes it ineligible for any biodegradation consideration in HRS. That is contrary to DoD findings that vinyl chloride biodegradation is almost always sufficient to protect buildings from vapor intrusion, even in a population of sites with generally high water tables.	*limited review of data pertaining to the half-life of vinyl chloride, including the references cited by the commenter, and found that the value in interim half-life list provided at proposal appears to be in the lower range of reported half-lives for vinyl chloride. Therefore, the use of this value would be consistent with EPA's mandate to be protective of human health.*
EPA Policy Language: EPA seeks public input on the following question regarding the calculation of hazardous waste quantity: How could EPA further take into account the differences in dilution and air exchange rates in large industrial buildings as compared to smaller residential and commercial structures when calculating the hazardous waste quantity for the HRS SsI Addition? **Proposed Revision / Comment:** EPA's proposed system for hazardous waste quantity is very difficult to understand. In general, scoring is supposed to start with Tier A and only proceed to the lower tiers if you don't have enough information for Tier A; then proceed to Tier B, etc. As explained in the preamble to the 1990 HRS, EPA will not collect the information necessary to determine tier A estimates, however if the information is provided during comment EPA will evaluate the data and use it as appropriate. DoD's understanding of tier A as currently defined (the mass of constituents found in the regularly occupied structure(s) where the observed exposure has been identified) requires an indoor air sample and an estimate of building volume. As such DoD does not understand why EPA will not use this information for estimating waste quantity using tier A where exposure is observed. Since the units of tier A are pounds and the mass in indoor air at any one time is low, using tier A is unlikely to result in a high score in Table 2-6; because even 100 lb of hazardous waste in indoor air at any one time would be a very unusual situation; thus, scoring with the current tier A approach does not make sense. DoD points out that EPA's approach to hazardous waste quantity, as implemented in their examples, has virtually nothing to do with contamination. EPA's approach to indoor air would be analogous to calculating waste quantity for the drinking water pathway by multiplying the concentration at the tap by the volume in the water supply system. EPA counts buildings in the area of subsurface contamination and area of observed exposure in their examples, multiplies this by an assumed house square footage, and then divide by a constant. A defensible explanation of how this factor provides useful information about vapor intrusion has not been provided. There is no relationship between the building size and the amount of exposure, because there is no relationship between building size and inhalation rate (see EPA Exposure Factor Handbook). EPA should delay promulgation of the rule until a rational approach to hazardous waste quantity is developed and guidance for the full implementation of the rule is available. EPA should consider the way hazardous waste quantity is calculated for most of the other pathways (which focuses on the mass released), but should focus on the proportion of the released mass that could reasonably be expected to eventually be transported to indoor air (such as the mass in shallow groundwater or shallow soils). EPA may only want to do this only for tiers A and B.	*The tiered method for determining hazardous waste quantity is laid out in the HRS. Tier A represents the total mass of hazardous substances at a site that may have entered a regularly occupied structure over time. The commenter's understanding of Tier A as requiring an indoor air sample and an estimate of the structure's volume would only provide a partial estimate for Tier A, as the commenter's estimate would be a one-time estimate of the mass of constituents found in a regularly-occupied structure, not an estimate of the total mass of constituents to ever enter the structure. (See HRS Section 2.4.2.1.1, Hazardous constituent quantity, which states, "[i]f the hazardous constituent quantity for the source (or area of observed contamination or area of observed exposure) is adequately determined (that is, the total mass of all CERCLA hazardous substances in the source and releases from the source [or in the area of observed contamination or area of observed exposure] is known or is estimated with reasonable confidence), do not evaluate the other three measures discussed below.") If a complete Tier A calculation cannot be adequately determined the HRS SsI procedure would then evaluate other tiers as appropriate and the highest value estimated from any tier evaluation would be assigned as the Hazardous Waste Quantity for the regularly occupied structure. Only if the Tier A value covers all hazardous substances released over time would the Hazardous Waste Quantity value be based on the Tier A estimate. If the total mass of all hazardous substances is not known or estimated with reasonable confidence, evaluation should advance to Tier B, and so on. EPA agrees a full evaluation of Tier A is an unlikely scenario for the SsI component, and may rarely be used in any HRS pathway, as it requires an evaluator to know the total quantity, or an estimate of reasonable confidence of the total quantity, of the release of hazardous substances ever to occur at the site.* *EPA agrees the relationship between hazardous waste quantity and exposure levels in the SsI component is not exact, however, EPA does consider structure size to be directly correlated with the dose of hazardous substances to which occupants of structures may be exposed. It is an estimate of the total mass released or likely to be released into regularly occupied structures at a site. Therefore, it is also a surrogate for dose, which can be roughly defined for the threat due to subsurface intrusion as "the quantity a receptor may inhale." The larger a structure, the more of a subsurface plume may be covered by the structure, the more subsurface contamination may build up below the structure, and the greater the possibility that one or multiple preferential pathways may exist from the subsurface into the structure; therefore the greater the amount of hazardous substances may enter the structure. Therefore, the larger the size of the structure, the more likely a greater mass of hazardous substances may enter the structure and the greater the quantity to which occupants may become exposed. Furthermore, EPA considers it reasonable to assume that, in general, the larger the structure the more likely the number of people that may occupy the structure and actually breathe in the available dose. (EPA notes that the magnitude of the population exposed is also accounted for in other HRS factors, that reflect the population occupying structures in areas of observed exposure and in areas of subsurface contamination, and that these factors will serve to correct for any inaccuracy in this structure size/population relationship assumption based on site-specific conditions.)* *The decision to include waste quantity as a surrogate for dose for all HRS pathways and components was made when the HRS was last revised in 1990. The decision was based on the concept that determining an accurate dose and length of exposure that receptors would be exposed to was beyond the scope of information available after a site inspection. It is not possible to accurately predict the hazardous substance concentration that receptors would be exposed to over a representative exposure period based on information collected during a site inspection due to the variability in exposure levels over time and space. Instead, hazardous waste quantity is used as a surrogate for dose in the sense that the quantity of the hazardous substances is at least qualitatively correlated to the magnitude of the exposure. If there is no waste quantity, there will be no exposure;*

Comment	Response
	as the waste quantity increases, the greater the possibility of exposure to hazardous substances that a receptor may come in contact with. *EPA considers it inappropriate to delay the rulemaking until guidance on application of the SsI component is developed, as suggested by the commenter. Many topics are appropriate for guidance, especially those which are dependent on site-specific conditions that cannot be comprehensively covered and would not be appropriate in the rule, as well as other procedures may evolve with advances in science and with experience. It would be inappropriate and contrary to EPA's mandate to protect human health and the environment to delay addressing the threat posed by these sites until new research is completed and methodologies are proven effective when sufficient information is already present, as identified in the scoring of the 11 Tier 1 test sites.* *EPA did not make any changes to the evaluation of hazardous waste quantity in the final rule based on the comments received as the type of information needed in these responses is generally not available during a typical site inspection. The HRS has been designed to be applied consistently to a variety of sites. The HRS is not a tool for conducting quantitative risk assessment; it is a tool to measure relative threat posed by contamination among sites and not an absolute site-specific risk.*
EPA Policy Language: EPA seeks public input on the following question regarding subsurface source strength: The HRS SsI Addition considers source strength in delineating ASCs and AOEs, in scoring likelihood of exposure, in assigning waste quantity specifically when estimating hazardous constituent quantity and in weighting targets in an ASC. The HRS algorithm for all pathways incorporates the consideration of source strength in determining an HRS site score. Could EPA further take into account source strength in performing an HRS evaluation? **Proposed Revision / Comment:** While source strength may be partially and indirectly accounted for in each of the categories, the end result is source strength is still not effectively accounted for and results in false positives and false negatives as demonstrated by DoD previously. The flaw in the current HRS SsI structure remains whereby sites overlying dilute plumes can score the same as sites overlying high source concentrations. DoD proposes incorporating a weighting factor in the targets category to more effectively account for subsurface source strength. The argument that subsurface source strength was already accounted for and EPA needs to be consistent with the weighting and scoring process used for the other pathways is not defensible because EPA already weights workers in the targets category for the proposed rule differently for the SsI pathway. Using the proposed methodology, source strength is partially and indirectly accounted for in each of the categories. However, the end result is inadequate since the overall SsI score can result in both false-positive and false-negative scoring (as demonstrated in scoring examples submitted by DoD previously). For instance: In the Potential for Exposure category, Depth to Contamination indirectly accounts for subsurface source strength by decreasing the score as the depth to contamination increases. However, the score is unaffected by differences in source strength, meaning that high source concentrations (e.g., dense non-aqueous phase liquid [DNAPL]) located at 30 feet below the building foundation are weighted less than dilute concentrations (e.g., groundwater concentrations slightly above background) located at 5 feet below the building foundation. The other subcategories within the Potential for Exposure (i.e., Structure Containment, Vertical Migration, and Vapor Migration Potential) do not account for subsurface concentrations. In the Waste Characteristics category, depending on what information is available, the concentration of indoor air may be used to determine the Hazardous Waste Quantity (i.e., using Tier A or B) and to determine the overall score for the Waste Characteristics category. It may be argued that indoor air concentrations are an indication of subsurface source strength; however, this assumes that indoor concentrations can be adequately characterized. Well studied sites have demonstrated that indoor air concentrations can vary significantly over time (i.e., 1-3 orders of magnitude), which can make it difficult to determine a representative indoor air concentration during a site	*EPA has reviewed the suggestions submitted by commenters regarding source strength, and has added a consideration of source strength in the subsurface to the assignment of the degradation factor value, and also in the weighting of targets in ASCs. Specifically, in the promulgated SsI component, weighting factors for populations within an ASC (see HRS Table 5-21, Weighting Factor Values for Populations Within an Area of Subsurface Contamination, were revised to include a consideration of source strength when a NAPL is present. The presence of NAPLs was also included in Section 5.2.1.2.1.2, Degradation. The presence of NAPLs represents a situation in which the contaminants in the NAPL are present at high concentration and are likely to be present at these concentrations for a significant amount of time. There is no parallel justification for further consideration of source strength beyond that which is already included in the SsI component.* *Regarding the comment on consistency within the HRS as it applies to scoring of workers within the SsI component, the evaluation of workers in the SsI component is performed differently due specifically to the difference in exposure scenarios between the SsI component and the other HRS pathways and components. Most workers are usually not present in a structure the same amount of time as residents, and therefore, the target weighting assigned to workers for the SsI component is less than that for residents. This difference in worker weighting is consistent with other parts of the HRS, as a similar rationale is used in the Soil Exposure component. In the Soil Exposure component workers are also weighed less than residents, reflecting that most workers are rarely exposed to outdoor soils at their place of work for as long a duration as residents are at home.* *EPA did not add further consideration of source strength to the assignment of the hazardous waste quantity value because it already allows for consideration of contaminant concentration data when indoor air contaminant concentrations are known (in estimating the mass of hazardous substances that have entered regularly occupied structures).* *EPA did not add consideration of contaminants at concentrations lower than those that would indicate the presence of NAPLs to be present to the rule. As pointed out by several commenters, the variation in contaminant levels, both temporally and spatially, has been found to be quite significant, in the range of multiple orders of magnitude. Therefore, EPA cannot be confident that concentration measurements from a limited screening event would actually be reflective of actual hazardous substance concentrations in the subsurface throughout a site.* *EPA disagrees that the submitted scoring scenarios using the proposed SsI component demonstrate that the SsI component can result in false-positives and false-negatives (which based on the discussion of the examples, the commenter appears to define as an HRS site score one that is not reflective of the actual site-specific risk). The commenter submitted four scoring scenarios, each scored using the proposed SsI component and the commenter's proposed changes to the proposed SsI component. Two of the examples using the SsI component, as proposed, showed similar scores regardless of a difference in subsurface contaminant concentrations. The other two examples had indoor air contaminant concentrations, but in one the concentration was above a health-based benchmark, and the other below the benchmark, but again the site scores were roughly equivalent. The commenter argued that the difference in subsurface and indoor air source strengths should have resulted in greater HRS site scores for the example with higher source strength. However, upon examination of the examples, the differences in the source strengths in both paired site examples were within the reported range of temporal and spatial variation found at actual sites (including in at least one study sponsored by DoD: U.S. Environmental Protection Agency, EPA's Vapor Intrusion Database: Evaluation and Characterization of Attenuation Factors for Chlorinated Volatile Organic Compounds and Residential Buildings. EPA 530-R-10-002. March 16, 2012). Without performing long-term site-specific monitoring studies equivalent to those performed during a remedial investigation for purposes of performing a site-specific risk assessment, it*

Comment	Response
investigation. In the Targets category, subsurface source strength is used in delineating ASCs (i.e., soil gas and groundwater plumes), but the middle of the ASC is treated the same as the edge of the ASC. This logic assumes that the potential for vapor intrusion is constant throughout the ASC. Here, the most sensitive factor is the number of targets; the concentration in the subsurface doesn't impact the score. The primary control on the targets category score is whether an indoor air samples has been collected. The bottom line is that sites overlying dilute plumes can score the same as sites overlying high source concentrations.	*would not be possible to know with confidence that the difference in the contaminant concentrations were representative of actual differences in the concentrations to which occupants of the example structures would be exposed. Because HRS site scoring is based on screening site investigations of limited duration, it is not possible at many sites being evaluated for placement on the NPL to know with confidence the site-specific exposure levels at the time of an HRS evaluation. Therefore, EPA does not consider DoD's comments on the SsI component based on these examples to be valid.* *Regarding the suggested modifications in the weighting of target populations suggested by the commenter, the rational for the changes are again based on the assumption that the source strength is known with confidence at the time of the HRS evaluation, which as explained above, is an invalid assumption. EPA also notes that, if implemented, the same level of risk to humans would result in sites being placed on the NPL evaluated using other HRS pathways and components, but not in the SsI component. Therefore, the HRS site score would not represent the same level of relative risk posed by different pathways among sites.* *EPA agrees the Potential for Exposure factor evaluation does not account directly for actual subsurface concentrations because such concentrations cannot be adequately determined based on a time-limited screening assessment. However, the Potential for Exposure factor does use attenuation concepts (e.g., depth to contamination, vertical migration, vapor migration potential) to weight the likelihood of lower concentrations of intruded vapors in comparison to their source concentrations.* *Regarding the commenter's examples of where in the three HRS factor categories (likelihood of exposure, waste characteristics and targets) source strength is not adequately considered, EPA considers these criticisms to also be invalid. EPA does not disagree that source strength, if known at all sites being ranked in a relative manner using the HRS, could be further incorporated into all categories of an HRS evaluation and improve the correspondence between an HRS score and the level of site-specific risk at individual sites. However, as explained previously, it is not possible to know or predict source strength with confidence based on the information available after a time-limited screening assessment, which is the amount of information available at most sites when an HRS evaluation is performed. To require this level of information to be collected for each site being evaluated using the HRS would eliminate the need to prioritize the sites for further investigation as the majority of the investigation needed to perform a site-specific risk assessment would have been completed.*
EPA Policy Language: EPA is proposing to establish an AOE based on documented contamination meeting observed exposure criteria (either by direct observation or chemical analysis). Consistent with the weighting of populations throughout the HRS (see section 2.5 of the current HRS), the proposed subsurface intrusion component will weight targets subject to Level I contaminant concentrations by a factor of 10 and weight targets subject to Level II contaminant concentrations by a factor of 1. **Proposed Revision / Comment:** Source strength is not adequately accounted for to produce a useful prioritization process. Level I exposures occur routinely in ambient air in many places in the US.	*EPA reviewed the suggestions submitted by commenters and revised the SsI component to add a consideration of source strength in the subsurface, both to the assignment of the degradation factor value and in the weighting of targets in areas of subsurface contamination. EPA also added consideration of subsurface source strength to the assignment of a degradation factor when the presence of non-aqueous phase liquids (NAPLs) were identified at depths of 30 feet or less, and to the weighting of targets in an ASC when NAPLs are present.* *EPA did not revise the SsI component to add consideration of subsurface contaminants at concentrations less than that which would indicate the presence of a NAPL to the rule. As pointed out by several commenters, the variation in contaminant levels temporally and spatially, both in the subsurface and indoors, has been found to be quite significant, in the range of multiple orders of magnitude. Therefore, EPA cannot be confident that concentration measurements from a time-limited screening assessment would actually be reflective of actual hazardous substance concentrations in the subsurface or indoor air at all times and throughout the site.* *EPA notes that the consideration of the concentration of hazardous substances (e.g., source strength) present at a site was an issue raised the last time the HRS was revised in 1990. The HRS for all pathways and components incorporates concentration data in the three category factors: 1) Likelihood of release/likelihood of exposure (concentration data can be used to establish an observed release or observed exposure); 2) hazardous waste quantity (e.g., concentration data, if sufficient data is available, can be used for calculating hazardous constituent quantity, Tier A; and 3) targets (e.g., concentrations of hazardous substances present in an indoor air [i.e., Level I and II targets] or subsurface samples [i.e., NAPLs] can be used to determine weightings for populations in an AOE or ASC).* *Regarding the frequency of occurrence of Level I concentrations, the point of this assertion is unclear. If the commenter is suggesting that most sites will have Level I targets because the background contaminant level is often already above health-based benchmarks, this is an inaccurate assumption. For a target to be identified as exposed to Level I concentrations, it must be shown the sample concentrations meet both observed exposure criteria and are at a concentration equal to or above an HRS-specified health-based benchmark. To meet the observed exposure criteria, the contaminant concentration must be significantly above background. Therefore, even if the background level is above a health-based benchmark, the evaluator must still show the release sample concentration is significantly above background and that the attribution criteria has*

Comment	Response
	also been met for the sample to meet observed exposure criteria, and to be considered a Level I exposure. For all pathways of the HRS the attribution requirement (see HRS Section 2.3, Likelihood of release) is that "[s]ome portion of the significant increase above background must be attributable to the site." Therefore, to be eligible for use in HRS scoring, the Level I concentrations in indoor air must be shown to have been significantly increased due to, at least in part, subsurface contamination, and not from indoor sources.
EPA Policy Language: To evaluate the proposed subsurface intrusion component and factor category weighting, EPA developed three conceptual site scenarios: one that would not qualify for the NPL (score below 28.50); one that would qualify marginally for the NPL (score of about 28.50); and one that should clearly qualify for the NPL (site score considerably above 28.50). **Proposed Revision / Comment:** EPA provided updated scoring for 11 test site examples that appear to be drawn from real world experience. However almost all of the sites analyzed score near or above 28.5 and most emphasize residential receptors. EPA thus has not provided evidence that the HRS as proposed will be an effective priority setting tool for vapor intrusion sites. As currently proposed the HRS process has the potential to score high with concentrations even below screening levels, potentially resulting in sites inappropriately scoring above 28.5. Consequently HRS would potentially prioritize as high risk persons exposed to concentrations below current risk based screening levels, while fewer receptors exposed to concentrations well above risk based levels may score low. DoD recommends EPA consider the magnitude of concentrations as a more rational basis for assignment of a site as a national priority, then concentrations merely above background, as is proposed.	*The 11 Test Sites are a subset of the 1,073 sites initially identified as sites at which subsurface intrusion may be posing a threat to human health that could be used for evaluating the SsI component. The 11 Test Sites were chosen due to the presence of a subsurface intrusion threat, the documentation of sufficient number of targets exposed to contaminated indoor air as well as other HRS-required evaluation factors to suggest the site might be a candidate for the NPL, and because data was available for these sites for which to test various portions of the SsI component. The need to identify sites that would test all parts of the SsI component scoring mechanism resulted in the selection of these sites which had a significant SsI threat and would have a high likelihood of achieving an HRS site score of 28.50 or greater. It was unknown whether these sites would qualify for the NPL when they were chosen as Test Sites, as the SsI scoring process had not been developed. That 10 of the 11 Test Sites have a projected HRS site score of 28.50 or greater using the SsI component is not an indication that the addition of the SsI component will result in a large number of SsI sites qualifying for the NPL; this would only be a possible projection if the Test Sites were chosen randomly so as to represent a typical SsI site. The Test Sites were not randomly chosen, but instead were specifically chosen because they have a documented subsurface intrusion threat at the sites and sufficient available data to test all parts of the SsI component. This also does not mean that a similar percentage of the 1,073 sites would also have an HRS site score of 28.50 or greater. The overall inventory of sites was compiled based on a strategy for identifying sites that exhibit a potential threat from subsurface intrusion.* *Regarding the commenter's suggestion to use the magnitude of concentrations (i.e., source strength) to determine a site's prioritization, due to the several orders of magnitude in variation in contaminant concentrations documented at sites with long-term monitoring of subsurface intrusion levels (see Schumacher, B. et al. (March 19, 2013), Indoor Air and Soil Gas Temporal Variability: Effects on Sampling Strategies under Controlled and Uncontrolled Condition. Looking Beyond Natural Variation in Vapor Intrusion. Workshop conducted at the 2013 Association for Environmental Health and Sciences Foundation and Environmental Protection Agency West Coast Conference, VI Workshop ; Lutes, C. et al (March 18, 2014). Four Winters of Continuous Vapor Intrusion Monitoring In Indianapolis – Temporal Variability in Indoor Air. Longterm Stewardship of Vapor Intrusion Exposures. Workshop conducted at the 2014 Association for Environmental Health and Sciences Foundation and Environmental Protection Agency West Coast Conference, VI Workshop), it is not possible to project source strength with reasonable confidence at all sites that may be evaluated using the HRS for placement on the NPL based on the data often available at the time of an HRS evaluation. However, to the extent possible, EPA does consider the magnitude of concentrations in indoor air samples, such as in assigning Level I and Level II weightings to targets. The target factor category scores assigned to populations exposed to concentrations below health-based benchmarks (i.e., Level II) are weighted one-tenth of what those exposed to concentrations above health-based benchmarks (i.e., Level I) are weighted. Therefore, assuming the likelihood of exposure and waste characteristics factor category values are constant, it would take ten times as many people exposed to concentrations below health-based benchmarks as those exposed to concentrations above a health-based benchmark to achieve the same SsI component score and HRS site score.*
EPA Policy Language: If a toxicity factor value of 0 is assigned to all hazardous substances available to a particular pathway (that is, insufficient toxicity data are available for evaluating all the substances), use a default value of 100 as the overall human toxicity factor value for all hazardous substances available to the pathway. For hazardous substances having usable toxicity data for multiple exposure routes (for example, inhalation and ingestion), consider all exposure routes and use the highest assigned value, regardless of exposure route, as the toxicity factor value. **Proposed Revision / Comment:** Based on the methodology provided by the proposed rule, chemicals without inhalation toxicity values (e.g., *cis* -1,2-DCE) can be assigned toxicity based on other exposure routes. For the *cis* -1,2-DCE example, a toxicity value of 1,000 would be applied. This means that cis-1,2-DCE could drive the risk at certain sites. The toxicity factor approach in this section [the SsI component] substantially overstates the toxicity of cis-1,2-	*Regarding hazardous substances without inhalation toxicity values, the toxicity factor value for hazardous substances in the SsI component is assigned considering toxicity data across exposure routes, consistent with the assignment of toxicity for all HRS pathways and components in the 1990 HRS (see 1990 HRS Section 2.4.1.1). As explained in the preamble to the 1990 HRS, multiple human exposure routes are possible for each HRS pathway/component, and therefore for this reason and to avoid the added complexity of route-specific toxicity evaluations that could vary from site to site, the toxicity factor is based on the greatest route-specific value available. Furthermore, this approach has been upheld by the U.S. Court of Appeals for the D.C. Circuit. See Carus Chem. Co. v EPA, 395 F.3d 434 (D.C. Cir. 2005) (holding that EPA may use any toxicity data from any exposure route [e.g., inhalation] in determining the toxicity factor value for a hazardous substance applied to scoring any HRS migration pathway).* *Regarding toxicity factor values for cis-1,2-DCE or other substances, the toxicity factor value applied to any specific substance is outside the scope of this rulemaking. The rule identifies how to use data to perform a relative site ranking (including assigning the toxicity factor for specific substances based on up-to-date toxicological data), but does not specify toxicity factor values for the substances in question. On the subject of*

Comment	Response
dichloroethylene (cis- 1,2-DCE), a degradation product for perchloroethylene (PCE) and trichloroethylene (TCE) in groundwater. Cis- 1,2-DCE is commonly found at chlorinated volatile organic compound (VOC) sites where groundwater is undergoing Monitored Natural Attenuation (MNA). The interim Superfund Chemical Data Matrix notes that cis- 1,2-DCE has no cancer or non-cancer risk benchmarks which indicates there is no Inhalation Unit Risk (IUR) factor or Reference Concentration (RfC) for this substance. The toxicity score in the SCDM for cis-1,2-DCE is 1,000, which is the same toxicity score for TCE. This potentially undercuts the objective of groundwater MNA remedies which is to allow degradation of principal threat contaminants such as PCE and TCE to less toxic or less persistent products. It creates the risk that non-CERCLA groundwater sites undergoing MNA for PCE or TCE might become listed on the NPL, particularly for sites where anaerobic processes have stalled at cis-1,2- DCE degradation. EPA's reasoning for assigning a toxicity score of 1,000 to cis-1,2-DCE is not clear. One possible explanation is that USEPA has used the oral Reference Dose (RfD) of 0.002 mg/kg-day as the appropriate non-cancer toxicity value for an inhalation exposure pathway. However, such route-to-route extrapolation from oral to inhalation exposures without use of a physiologically-based pharmacokinetic model (PBPK) is no longer an appropriate practice in toxicity assessment, and is no longer used for non-cancer inhalation toxicity values published on IRIS. A second possible explanation is that EPA considers cis-1,2-DCE to have no suitable toxicity information; however, an LC50 of 54,200 mg/m3 is available, according to the documentation on IRIS. The LC50 value would provide a much lower toxicity score of one (1), as shown on the table on page 10404 of the FR notice. Though cis-1,2-DCE is the only example discussed, the possibility exists that for other substances, the inappropriate handling of toxicity values leads to incorrect toxicity scores. However, it is of greater concern that groundwater MNA remedies for chlorinated VOCs might become listed on the NPL based on the inappropriate description of the toxicity of cis-1,2-DCE. However as noted in other comments if vinyl chloride is present, it will control the scoring with a toxicity factor of 10,000, even though vinyl chloride is generally degraded in the vadose zone and thus does not pose a significant vapor intrusion risk.	*hazardous substances resulting from remedial treatment activities, except in establishing attribution of a significant increase to a site (in identifying observed release, observed contamination, or observed exposure) the HRS does not consider the root cause of the presence of a substance in determining its eligibility for consideration in HRS scoring, and does not exclude a substance based on such information. Therefore, if a substance is present at a site and qualifies as a CERCLA hazardous substance, or CERCLA pollutant or contaminant, the substance may be considered in site scoring; it posed a possible threat regardless of how it came to be released at the site.* *Regarding the toxicity factor value of 1,000 for cis-1,2-DCE presented in the interim SCDM values document at the time of proposal and referred to by the commenter, EPA notes that this is indeed based on the oral reference dose value of 0.002 mg/kg-day.* *Regarding the LC50 value that would result in a lower toxicity factor value, per the 1990 HRS and SsI component methodology, the toxicity factor value would instead be assigned based on the greatest route-specific value available. This represents the greatest possible threat posed by the presence of the substance and its use is consistent with EPA's mandate to be protective of human health. Therefore, a toxicity factor value of 1,000 (based on the oral reference dose value of 0.002 mg/kg-day) would be assigned.* *Regarding the degradation of vinyl chloride, as described above for any substance-specific toxicity value, the degradation factor value applied to any specific substance is outside the scope of this rulemaking. The rule identifies how to assign a degradation factor value based on measured half-lives, but does not specify degradation factor values for the substances in question. Related to the degradation values presented in the Interim SsI SCDM Table referred to by the commenter, these were interim values based on peer reviewed literature; if the commenter wishes to submit additional information, EPA will review the information for use in assigning these values in the scoring of specific sites at a later date.*
EPA Policy Language: If the hazardous constituent quantity for the source (or area of observed contamination or area of observed exposure) is adequately determined (that is, the total mass of all CERCLA hazardous substances in the source and releases from the source [or in the area of observed contamination or area of observed exposure] is known or is estimated with reasonable confidence), do not evaluate the other three measures discussed below. Instead assign these other three measures a value of 0 for the source (or area of observed contamination or area of observed exposure) and proceed to section 2.4.2.1.5. **Proposed Revision / Comment:** As explained in the preamble to the 1990 HRS, EPA will not collect the information necessary to determine tier A estimates, however if the information is provided during comment EPA will evaluate the data and use it as appropriate. DoD's understanding of tier A as currently defined "the mass of constituents found in the regularly occupied structure(s) where the observed exposure has been identified" requires only an indoor air sample and an estimate of building volume. Therefore, won't the information needed for tier A estimates be available? EPA's approach to hazardous waste quantity, as implemented in their examples, has virtually nothing to do with the actual quantity of contamination. EPA is counting buildings in the area of subsurface contamination and area of observed exposure, and then multiply by an assumed house square footage. A defensible explanation about how this factor provides any useful information for assessing vapor intrusion should be provided. There is no relationship between the building size and the amount of exposure, because there is no relationship between building size and inhalation rate (see EPA Exposure Factor Handbook).	*The commenter does not accurately describe how the Tier A, hazardous constituent quantity, factor is evaluated. The estimated Tier A value includes the total mass of <u>all</u> releases that <u>have ever</u> entered into a regularly occupied structure. Specifically, HRS Section 2.4.2.1.1 of the HRS SsI Addition states: "If the hazardous constituent quantity for the source (or area of observed contamination or area of observed exposure) is adequately determined (that is, the total mass of all CERCLA hazardous substances in the source and release from the source [or in the area of observed contamination or area of observed exposure] is known or estimated with reasonable confidence), do not evaluate the other three measures discussed below. … If the hazardous constituent quantity is not adequately determined, assign the source (or area of observed contamination or area of observed exposure) a value for hazardous constituent quantity based on the available data and proceed to section 2.4.2.1.2."* *As discussed in the preamble to the proposed 1988 version of the HRS (53 FR 51972 - 51973, December 23, 1988), EPA developed a tiered system of determining the hazardous waste quantity to better reflect the amount of hazardous substances in the waste. EPA recognizes that, at some sites, sufficient data may be available to determine a Tier A hazardous constituent quantity, and the HRS directs EPA to use these data where they are available. At most sites, however, obtaining these data would be difficult and costly. Therefore, when data to support the actual quantity of hazardous substances deposited on site are complete and accurate, the hazardous constituent quantity, Tier A, provides the most accurate determination of the quantity of hazardous substances at the site. However, sufficient information to adequately determine a regularly occupied structure's hazardous constituent quantity may not be available. For example, the commenter's example of using a single indoor air sample at a single point in time and an estimate of a structure's volume to estimate the hazardous constituent quantity would be unlikely to provide with reasonable confidence sufficiently complete information to calculate the total mass of all releases if the subsurface intrusion occurred over time. Instead, the estimate would only be a partial estimate of the hazardous constituent quantity for the moment the sample was collected; therefore, because it is not an estimate of the total amount of hazardous substances that have ever entered the structure, other hazardous waste quantity tiers would be evaluated as appropriate and the highest value assigned as the hazardous waste quantity for that structure.* *Regarding the commenter's assertions that the HRS hazardous waste quantity evaluation does not represent the quantity of contamination or*

Comment	Response
	provide relevant information for an assessment of the vapor intrusion threat, EPA agrees the relationship between hazardous waste quantity and exposure levels in the SsI component is not exact, but EPA does consider structure size to be directly correlated with the dose of hazardous substances to which occupants of structures may be exposed. It is an estimate of the total mass released or likely to be released into regularly occupied structures at a site. Therefore, it is also a surrogate for dose, which can be roughly defined for the threat due to subsurface intrusion as "the quantity a receptor may inhale." The larger a structure, the more of a subsurface plume may be covered by the structure, the more subsurface contamination may build up below the structure, and the greater the possibility that one or multiple preferential pathways may exist from the subsurface into the structure; therefore the greater the amount of hazardous substances may enter the structure. Therefore, the larger the size of the structure, the more likely a greater mass of hazardous substances may enter the structure and the greater the quantity to which occupants may become exposed. Furthermore, EPA considers it reasonable to assume that, in general, the larger the structure the more likely the number of people that may occupy the structure and actually breath in the available dose. (EPA notes that the magnitude of the population exposed is also accounted for in other HRS factors, that reflect the population occupying structures in areas of observed exposure and in areas of subsurface contamination, and that these factors will serve to correct for any inaccuracy in this structure size/population relationship assumption based on site-specific conditions.)The agency notes that the decision to include hazardous waste quantity as a surrogate for dose in all HRS pathways and components was made when the HRS was last revised in 1990 (see Section V.3 of the proposed 1988 HRS, 53 FR 51692, December 23, 1988; Section III.C of the 1990 HRS, 55 FR 51542, December 14, 1990). The decision was based on the concept that determining an accurate dose that receptors would be exposed to was beyond the scope of information available after a site inspection. It is not possible to accurately predict the hazardous substance concentration that receptors would be exposed to over a representative exposure period based on information collected during a site inspection due to the variability in exposure levels over time and space. Instead, hazardous waste quantity is used as a surrogate for dose in the sense that the quantity of the hazardous substances is at least qualitatively correlated to the magnitude of the exposure. Furthermore, using the structure size to project a hazardous waste quantity in the SsI component is representative of the likelihood a target could be exposed to hazardous substances, as a target may be exposed to any portion of the indoor air within the structure; much in the same way a target may be exposed to a portion of all the contaminated soil in the soil exposure component, a portion of the contaminated sediments or surface water in the surface water pathway, and a portion of the contaminated ground water in the ground water pathway. *In addition, the method for calculating this factor is consistent with the use of hazardous waste quantity in all other HRS pathways and components and was found to be acceptable given the restraints of the use of site screening data when the HRS was reviewed by the U.S. Court of Appeals for the D.C. Circuit. See Eagle-Picher Industries, Inc. v United States Environmental Protection Agency, et al., 759 F.2d 905 (D.C. Cir. 1985) (holding that EPA has clearly indicated the limitations of the HRS model and that the agency intends to use the HRS to determine if a site warrants further assessment, not whether a site warrants response action under CERCLA). EPA also notes that neither the commenter nor any other commenter submitted an alternative method of determining the hazardous waste quantity from information collected during a typical time-limited screening assessment with sufficient detail to allow EPA to determine if it would increase the accuracy of the SsI component.* *The agency also notes that the HRS is intended as a screening tool, not a site-specific risk assessment, and as indicated by SARA, need not meet the requirements of a site-specific risk assessment, only to ensure "to the maximum extent feasible" the HRS accurately assesses relative risks associated with actual or potential releases of hazardous substances from a site. Specifically, as noted in the conference report for SARA, "This standard does not, however, require the Hazard Ranking System to be equivalent to detailed risk assessments, quantitative or qualitative, such as might be performed as part of remedial actions. ...Neither the revised Hazard Ranking System required by this section nor any other provision of law or regulation requires the conduct of risk assessments at unlisted or listed facilities." (House Conference Report No. 99-962, 99th Cong. 2nd Sess. at 199-200, (1986)).*
EPA Policy Language: General **Proposed Revision / Comment:** As noted previously by DoD, the proposed rule lacks prescriptive methods for sampling and analysis, most specifically for vapor intrusion, that would likely lead to an inconsistency in assessments and scoring across sites. This may lead to sites being scored erroneously, resulting in inflated HRS scores and sites being proposed for	*The HRS does not provide prescriptive methods for performing site investigations for any HRS pathway evaluation because the methods used during the collection and analysis of environmental samples depend on site-specific conditions, could not be written to cover all possible situations, and could become outdated in the future. It is also outside the scope of the HRS to identify and describe methods for conducting a subsurface intrusion screening for HRS purposes. Instead, sampling and analysis methods are considered appropriate topics for guidance, and information on this topic is available in EPA's 2015 VI guidance.* *Regarding the commenter's assertion that the lack of guidance on implementing the SsI component would lead to inconsistency in assessments between sites, potentially incorrect HRS site scores, and ineligible sites being placed on the NPL, the agency disagrees that this is a projected*

Comment	Response
listing on the NPL. EPA's 2015 VI guidance does not provide sufficient information about sampling and analysis to insure consistency. For example, the 2013 public comment draft of the EPA VI guide mentioned a document titled, "*Sampling and Analysis Methods for Vapor Intrusion Investigations*;" however, that document was never released and is not cited in the 2015 final VI guide. DoD would like to reemphasize the need for EPA to provide more specific guidance on sampling and analysis methods prior to promulgating the rule adding SsI to the HRS.	*outcome of promulgating the rulemaking. The agency notes that the SsI component was tested extensively throughout development of the rule, using multiple methods, to ensure that appropriate factors were considered in an evaluation and consistency with the structure of existing HRS pathways and components was maintained. (Please see section III.C, Testing the SsI Component, of the preamble and Appendix A: Conceptual Site Modeling/Sensitivity Analysis and Appendix B: Site Summaries and Scoring Information for Test Sites (Tier 1) of the TSD for the final HRS SsI Addition for additional information.) Additionally, the agency considers that appropriate resources are currently available for collecting sufficient information to conduct an HRS SsI evaluation. For example, Section 6.4 of EPA's June 2015 VI guide identifies basic principles, methods, and procedures for indoor air sampling. In addition, the agency notes that states, federal agencies, and private contractors have considerable experience in conducting vapor intrusion investigations and collecting vapor intrusion-related data. However, the agency notes that procedures for the implementation of the SsI component are possible topics for any future guidance documents developed.* *Regarding the commenter's statement that EPA's 2015 VI guidance does not provide sufficient information to ensure consistency in vapor intrusion investigations, the agency considers the sampling and data collection information in EPA's June 2015 VI Guide to be an appropriate resource for gathering data for HRS purposes. EPA also notes that states, other federal agencies, and private contractors also have considerable experience with investigating vapor intrusion threats and collecting vapor intrusion-related data. The agency also notes that the purpose of the VI Guide is different from that than of the HRS, which is to identify sites that warrant further investigation. Consistent with the concept of the HRS being a screening tool, the factors considered in an HRS evaluation are limited to the factors that can be evaluated in the limited scope of an SI. Therefore, because of the differences between the HRS and VI Guide, an HRS evaluation may not always be consistent with the VI Guide.* *Regarding the commenter's statements on the subject of other documents supporting EPA's 2015 VI guidance, this is outside the scope of this rulemaking; and, such suggested methodologies for sampling and analysis for the SsI component is a subject for any future guidance development.* *Regarding the commenter's request that EPA delay promulgation of the HRS SsI Addition until more specific guidance on its implementation is developed, EPA does not agree that promulgation of the HRS SsI addition needs to be delayed until guidance documents related to its implementation have been developed. Guidance on implementation of the SsI component was not necessary for evaluating the component, which is a scoring mechanism not procedures for data collection. Furthermore, any future guidance documents developed will provide details on collecting data to support an HRS SsI evaluation. EPA also notes that to delay addressing sites that may pose a significant human health risk until all necessary guidance documents have been developed would not be consistent with EPA's mandate to protect human health.*
EPA Policy Language: An area of observed exposure is delineated by regularly occupied structures with documented contamination meeting observed exposure criteria; **Proposed Revision / Comment:** Clarify if the delineation of contamination meeting or exceeding observed exposure criteria is to be conducted by sampling each unit of occupied structure within the exposure area, or if statistical methods can be employed.	*It is only necessary to document observed exposure in samples from a sufficient number of regularly occupied structures at a site to encompass an area which can then be designated as an AOE. All regularly occupied structures or subunits within that area need not be sampled to be included in the AOE, nor is it necessary to perform any statistical analysis to support this conclusion. In addition, the samples used for delineating the area need not be from every subunit in a structure. HRS Section 5.2.0, General considerations, states: "An area of observed exposure is delineated by regularly occupied structures with documented contamination meeting observed exposure criteria; an area of observed exposure includes regularly occupied structures with samples meeting observed exposure criteria or inferred to be within an area of observed exposure based on samples meeting observed exposure criteria (see HRS section 5.2.1.1.1, Observed exposure)." EPA notes however, that this section of the HRS also explains that some regularly occupied structures and regularly occupied subunits in the structures encompassed by the sampling may not be included in the AOE if available information indicates otherwise. Procedures for establishing when available information is sufficient to show "otherwise" will depend on multiple-site specific conditions and, therefore, is an appropriate topic for any future guidance.*
EPA Policy Language: Evaluate an area of subsurface contamination based on hazardous substances that: **Proposed Revision / Comment:** For vapor intrusion, clarify if soil vapor sample results are required for this evaluation [establishing an ASC] or if it can be based on concentrations of volatile organics dissolved in groundwater.	*The SsI component does not require specific sampling media, including soil vapor samples, be collected to establish an ASC. Therefore, ground water samples containing eligible hazardous substances can be used in the delineation of an ASC. HRS Section 5.2.0, General considerations, of the promulgated SsI component states: "An area of subsurface contamination is delineated by sampling locations meeting observed release criteria for subsurface intrusion, excluding areas of observed exposure (see Table 2-3 in HRS section 2.3, Likelihood of release)." The SsI component allows multiple types of samples (e.g., ground water, soil gas, soil, NAPLs) to be collected at every site and does not identify specific sampling methods to be used. The agency also notes that the specific language referenced by the commenter in HRS Section 5.2.0, General considerations, identifies the eligibility criteria that hazardous substances must meet to be eligible for consideration in an HRS SsI evaluation.*

Comment	Response
EPA Policy Language: Analysis of indoor samples indicates that the concentration of hazardous substance(s) has increased significantly above the background concentration for the site for that type of sample. **Proposed Revision / Comment:** The task [that of identifying AOEs] as described entails the collection of multiple rounds of indoor air and background air samples to obtain representative data following any standard vapor intrusion guidance, would be very time and resource consuming. For realistically achieving this goal during the SI, EPA should develop a simplified or statistical means of conducting this task based on limited sampling data.	*The SsI component does not require multiple rounds of air sampling to establish an AOE or the presence of observed exposures within a regularly occupied structure. The HRS is designed to evaluate a site based on limited data for all pathways; therefore, the SsI component was also designed so that complex or statistical methods were not required to establish an AOE. An HRS evaluation is not a site-specific risk assessment, it is screening tool designed to use limited data to determine whether further investigation of a site is warranted. Multiple rounds of air sampling or continuous sampling events are likely to be performed during an RI, which normally occurs after a site has been placed on the NPL and is used to collect the data necessary to perform a site-specific risk assessment. While some vapor intrusion guidance may call for multiple rounds of sampling, these guides may not be applicable to performing an HRS evaluation and likely do not have the purpose of prioritizing sites for further investigation as does an HRS evaluation.*
EPA Policy Language: A solid, liquid or gaseous material that contains one or more hazardous substances attributable to the site has been observed entering A regularly occupied structure through migration via the subsurface or is known to have entered A regularly occupied structure via the subsurface, or When evidence supports the inference of subsurface intrusion of A material that contains one or more hazardous substances associated with the site into A regularly occupied structure, demonstrated adverse effects associated with that release may be used to establish observed exposure. **Proposed Revision / Comment:** The text appears to indicate an observer may be able to "see" a gaseous material or that adverse effects would be apparent. It seems more likely that chemical analysis of indoor air samples would be the more definitive method of identifying exposure. Recommend revising the text to acknowledge how likely it will be that "gaseous material" can be observed or that an "adverse effect" would be observed. Chemical analysis of indoor air samples may be the only way subsurface vapor intrusion can be "observed".	*EPA acknowledges that visual observation of subsurface intrusion may be a rare event, but this does not mean it should not be an option when the appropriate information is available. Furthermore, the SsI component does not require visual observation. Observation can be established using other means, including using sampling to establish the hazardous substances present in direct observation. Establishing a release by direct observation is an appropriate topic for any future guidance on the implementation of the SsI component. For example, an observed exposure by direct observation can be documented if hazardous substances are found in a gaseous sample from an open sump into an occupied structure or moving from a foundation crack or opening into an occupied structure. The gaseous or liquid sample collected from the sump or foundation crack represents an observed exposure by direct observation in that hazardous substances are observed to be entering a living space from the subsurface. The sump and foundation cracks represent direct entry points from the subsurface. For further discussion of observed by direct observation please see HRS Section 3.2.a, Evidence by Direct Observation (Observed Exposure by Direct Observation) of the TSD for the promulgated HRS SsI Addition. Similarly, demonstrated adverse effects can be used to establish observed exposures by direct observation and may be established by other means than direct sampling, such as by medical examinations of exposed individuals showing impacts that can be linked to inhalation of hazardous substances. As demonstrating observed exposure by direct observation may be dependent on site-specific conditions, EPA considers methods for establishing an observed exposure by direct observation an appropriate topic for future guidance.*
EPA Policy Language: Some portion of the significant increase must be attributable to the site to establish the observed exposure. Documentation of this attribution should account for possible concentrations of the hazardous substance(s) in outdoor air or from materials found in the regularly occupied structure, and should provide a rationale for the increase being from subsurface intrusion. **Proposed Revision / Comment:** As previously noted by DoD, the type and amount of data needed to make this determination [the determination of attribution of at least part of the significant increase in indoor contamination concentrations is due to subsurface intrusion] is generally not collected during the PA/SI phase and requires a level of sophistication in methods and techniques that would likely require far more in depth procedures generally used at the remedial investigation phase. Indoor air measurements alone are insufficient, even when simply compared to background concentrations, to make a credible determination of attribution. Quantitative methods for such apportionment have been developed in the research literature but are rarely used at VI sites currently. Qualitative approaches are described on pages 82 and 83 of the 2015 EPA VI Guide in the chapter on "Detailed Investigation of Vapor Intrusion". This type of apportionment is unlikely to be feasible even with an expanded SI data set.	*EPA's experience is that sufficient information can be collected during a time-limited screening assessment to meet the HRS attribution requirement. EPA considers that the establishment of attribution for the SsI component is similar in the scope of information requirements as is required for establishing attribution for other HRS pathways. For HRS purposes absolute proof is not required, and the requirement may be met by providing a reasoned explanation that has not been shown to be incorrect. At some sites the establishment of attribution can be straight forward, while at others, it may require an ESI level of effort to collect the information necessary to meet the attribution requirement. This standard has been successfully achieved at least 1600 times for sites that have previously been placed on the NPL.* *EPA agrees with the commenter that multiple-lines-of-evidence will likely be needed to establish attribution for the SsI component at some sites, and what will be considered sufficient evidence will be dependent on site-specific conditions. EPA also agrees with the commenter that indoor air sampling alone is unlikely to be sufficient to establish attribution. Indoor air sampling and subsurface sampling may be required to establish attribution in many cases. Given the need to develop multiple-lines-of-evidence based on site-specific conditions establishing attribution for HRS purposes is an appropriate topic for any future guidance.*
EPA Policy Language: Table 5-12 Structure Containment: No. 9; Regularly occupied structure with a permanent engineered, active vapor mitigation system (e.g., active venting) with documented institutional controls (e.g., deed restrictions) and funding in place for on-going operation, inspection and maintenance. This does not include mitigation systems installed as	*The language in the SsI component regarding assigning containment for regularly occupied structures that have been the subject of removal actions by federal, state, and tribal authorities has been removed from HRS Table 5-12, Structure Containment. The corresponding containment value for situations where federal, state, or tribal authorities have completed a CERCLA removal action (or equivalent), that will effectively prevent subsurface intrusion from occurring if an active vapor mitigation system is operated properly (but does not remove the source of the contamination),*

Comment	Response
part of a removal or other temporary response by federal, state or tribal authorities. **Proposed Revision / Comment:** Based on the rationale proposed in Table 5-12, structure containment will not be assigned a value of 0 (i.e., lower potential for VI) when a mitigation system is present as part of a removal or other temporary response by federal, state, or tribal authorities. EPA's intent is that temporary responses by federal, state, or tribal environmental authorities are not to be credited. Federal potentially responsible parties (PRPs) may also unintentionally be disadvantaged by this language because they are also "federal authorities." Credit for containment should be equally valid if a mitigation system is installed by a private or federal PRP such as DoD.	*is now assigned a 1. This change responds to the commenter's concern by allowing consideration of public and private removal actions to be evaluated in a consistent manner.*
EPA Policy Language: If the depth to contamination (see section 5.2.1.1.2.2) is 10 feet or less, assign a value of 15. Do not consider layers of portions of layers within the first 10 feet of the depth to contamination. If, for the interval identified above, all layers that underlie a portion of a regularly occupied structure at the site are karst or otherwise allow channelized flow, assign a value of 15. **Proposed Revision / Comment:** It's unlikely that complex or intrusive studies will take place that would support the determinations in a subsurface intrusion assessment. Therefore, we believe it is unreasonable to expect that PA/SI level sampling can support this determination [identification of the type and thickness of geologic layers at the site between regularly occupied structures and the shallowest depth to contamination]. The required information requires borings completed to the shallowest impacted groundwater with careful geologic logging. Analysis, such as construction of a cross section or fence diagram may need to be completed to determine whether the layers of interest are continuous. This represents a degree of geologic data collection and analysis more typical of an RI.	*The assignment of a vertical migration factor is based on three pieces of information: the composition of the geologic layers in the subsurface at a site (e.g., sand, silt, shale) beneath any eligible structure within the site, the thickness of the layers, and an estimated porosity/permeability value of the least permeable layer. The layers present and their relative thickness can often be obtained from borings logs for any boring completed to the shallowest impacted ground water at a site. This geologic information is the same as required to estimate the potential for a substance to migrate to ground water performed as part of an HRS ground water migration pathway evaluation and has been successfully obtained at many sites previously placed on the NPL.*
EPA Policy Language: Table 5-14, Effective Porosity/Permeability of Geologic Materials **Proposed Revision / Comment:** It's unlikely that complex or intrusive studies will take place that would support the determinations in a subsurface intrusion assessment. Therefore, we believe it is unreasonable to expect that PA/SI level sampling can support this determination [the determination of the porosity/permeability of the geologic layers at a site].	*The assignment of a vertical migration factor is based on three pieces of information: the composition of the geologic layers in the subsurface at a site (e.g., sand, silt, shale) beneath any eligible structure within the site, the thickness of the layers, and an estimated porosity/permeability value of the least permeable layer. The estimate of the porosity/permeability of the layers can either be obtained from geologic studies in the area, which are often available from the U.S. Geological Survey or state geologic surveys, or can be estimated using HRS Table 5-14, Effective Porosity/Permeability of Geologic Materials of the SsI component. It is EPA's experience that such information can be obtained while installing wells as part of an SI at most sites, or from existing information. For example, many states require the submittal of geologic logs for any drinking water wells at the time of their installation. EPA agrees however that for some sites an ESI level of effort may be required to obtain this data.*
EPA Policy Language: Table 5-15, Vertical Migration Factor Values **Proposed Revision / Comment:** It's unlikely that complex or intrusive studies will take place that would support the determinations in a subsurface intrusion assessment. Therefore, we believe it is unreasonable to expect that PA/SI level sampling can support this determination [the assignment of a vertical migration factor value from HRS Table 5-15].	*The assignment of a vertical migration factor is based on three pieces of information: the composition of the geologic layers in the subsurface at a site (e.g., sand, silt, shale) beneath any eligible structure within the site, the thickness of the layers, and an estimated porosity/permeability value of the least permeable layer. As identified in the two comment responses provided immediately above (comment #'s 53 and 54), it is EPA's experience this information is often readily available or can be collected during an SI. Once this information is collected, the vertical migration factor can be assigned using HRS Table 5-15, Vertical Migration Factor Values.*
EPA Policy Language: For Tier A, hazardous constituent quantity, use the mass of constituents found in the regularly occupied structure(s) where the observed exposure has been identified. See also technical support document p 70 and 71. For Tier A, hazardous constituent quantity, use the mass of constituents found in the regularly occupied structure(s) where the observed exposure has been identified.	*The estimate provided by the commenter would represent a Tier A estimate of the mass of hazardous substances that has entered a regularly occupied structure, but the estimate is unlikely to represent the total mass of hazardous substances to have entered the structure due to subsurface intrusion with reasonable confidence. The commenter's estimate appears to use a one-time estimate of the concentration of a single substance with no consideration of the variability of that concentration spatially in the structure. This estimate also appears to assume that intrusion is occurring for only the time period during which the sample was collected, and was the only hazardous substance entering the structure via subsurface intrusion. This estimate would likely only be a partial estimate of the total hazardous constituent quantity for that particular substance, even if it*

Comment	Response
See also technical support document p 70 and 71. **Proposed Revision / Comment:** The calculation of hazardous waste quantity based on the mass observable appears to lead to results that do not seem to make sense and likely not defensible. For example assume that a concentration of TCE of 48µg/m3 (100x the conservative residential regional screening level) is present in indoor air in residential spaces. The total volume of residential spaces containing this concentration necessary to calculate a hazardous constituent quantity of 1 lb (and corresponding scoring value of 1) is 9.4E6 cubic meters. The mean residential volume in EPA's (2011) exposure factor handbook is 369 cubic meters (Table 17-2). Therefore 25,742 residences would have to have a concentration 100x the regional screening level for the hazardous waste quantity to reach 1 pound. Thus the waste characteristic score would be very low in Tier A for almost any imaginable indoor air exposure since the number of exposed houses with air concentrations above the RSL is typically less than 100 per site. (This example performs the computations using the formulas in Figure 5-1 of the TSD.)	*were the only hazardous substance that entered via subsurface intrusion. It does not account for the mass that had entered the structure previously and may have already escaped from the structure. Therefore, there would not be reasonable confidence that the estimate was representative of the total mass of all hazardous substances entering the structure by subsurface intrusion. Because it is likely only a partial estimate, other hazardous waste quantity tiers would be evaluated as appropriate and the highest value from the other estimates would be assigned as the hazardous waste quantity for that structure. Specifically, HRS Section 2.4.2.1.1, Hazardous constituent quantity, states: "If the hazardous constituent quantity for the source (or area of observed contamination or area of observed exposure) is adequately determined (that is, the total mass of all CERCLA hazardous substances in the source and release from the source [or in the area of observed contamination or each regularly occupied structure or subunit within an area of observed exposure] is known or is estimated with reasonable confidence), do not evaluate the other three measures discussed below…If the hazardous constituent quantity is not adequately determined, assign the source (or area of observed contamination or each regularly occupied structure or subunit within an area of observed exposure) a value for hazardous constituent quantity based on the available data and proceed to section 2.4.2.1.2. [i.e., Tier B, hazardous wastestream quantity]."*
EPA Policy Language: For Tier A, hazardous constituent quantity, use the mass of constituents found in the regularly occupied structure(s) where the observed exposure has been identified. See also technical support document p 70 and 71. For Tier A, hazardous constituent quantity, use the mass of constituents found in the regularly occupied structure(s) where the observed exposure has been identified. See also technical support document p 70 and 71. **Proposed Revision / Comment:** EPA's proposed system for hazardous waste quantity is very difficult to understand. In general, scoring is supposed to start with Tier A and only proceed to the lower tiers if you don't have enough information for Tier A; then proceed to Tier B, etc. DoD's understanding of tier A as currently defined (the mass of constituents found in the regularly occupied structure(s) where the observed exposure has been identified) requires an indoor air sample and an estimate of building volume. As such DoD does not understand why EPA will not use this information for estimating waste quantity using tier A where exposure is observed. Because the units of tier A are pounds and the mass in indoor air at any one time is low, using tier A is unlikely to result in a high score in Table 2-6; because even 100 lb of hazardous waste in indoor air at any one time would be a very unusual situation; thus, scoring with the current tier A approach does not make sense. EPA's approach to hazardous waste quantity, as implemented in their examples, has virtually nothing to do with contamination. EPA's approach to indoor air, would be analogous to calculating waste quantity for the drinking water pathway by multiplying the concentration at the tap by the volume in the water supply system. EPA counts buildings in the area of subsurface contamination and area of observed exposure in their examples, multiplies this by an assumed house square footage, and then divide by a constant. A defensible explanation of how this factor provides useful information about vapor intrusion has not been provided. There is no relationship between the building size and the amount of exposure, because there is no relationship between building size and inhalation rate (see EPA Exposure Factor Handbook). EPA should delay promulgation of the rule until a rational approach to hazardous waste quantity is developed and guidance for the full implementation of the rule is available. EPA should consider the way hazardous waste quantity is calculated for most of the other pathways (which focuses on the mass released), but should focus on the proportion of the released mass that could reasonably be expected to eventually be transported to indoor air (such as the mass in shallow groundwater or shallow soils). EPA may only want to do this only for tiers A and B.	*As discussed in the comment response immediately above (comment #56), it is unlikely that a single measurement of contaminant concentration and a one-time volume of air in a structure are likely to be sufficient information to estimate with reasonable confidence the total mass of all hazardous substance to have entered into a structure due to subsurface intrusion. If it were demonstrated to be a reasonable estimate, EPA agrees it could be used in an HRS SsI evaluation without estimating the quantity using other tiers. However, it has been EPA's experience that this is unlikely to be the case at most sites at the time of an HRS evaluation.* *As discussed in the preamble to the proposed 1988 version of the HRS rule (53 FR 51972 - 51973, December 23, 1988), EPA developed a tiered system of determining the hazardous waste quantity to better reflect the amount of hazardous substances in the waste at a site. EPA recognizes that, at some sites, sufficient data may be available to determine a Tier A hazardous constituent quantity, and the HRS directs EPA to use these data where they are available. At most sites, however, obtaining these data would be difficult and costly. Therefore, when data to support the actual quantity of hazardous substances deposited on site are complete and accurate, the hazardous constituent quantity, Tier A, provides the most accurate determination of the quantity of hazardous substances at the site. However, sufficient information to adequately determine a regularly occupied structure's hazardous constituent quantity may not be available. For example, the commenter's example of using an indoor air sample and estimate of a structure's volume to estimate the hazardous constituent quantity would not provide sufficiently complete information to calculate an estimated Tier A value. Instead, the estimate would only be a partial estimate of the hazardous constituent quantity; therefore, because it is not an estimate of the total amount of hazardous substances that have ever entered the structure, other hazardous waste quantity tiers would be evaluated as appropriate and the highest value assigned as the hazardous waste quantity for that structure.* *Regarding the commenter's assertions that the HRS' hazardous waste quantity evaluation does not represent the quantity of contamination or provide relevant information for an assessment of the vapor intrusion threat, EPA agrees that the SsI component's hazardous waste quantity factor is not a perfect surrogate for dose and that the relationship between hazardous waste quantity and exposure levels in the SsI component is not exact. However, the agency notes that there is at least a qualitative relationship between the amount of subsurface intrusion into a regularly occupied structure and the exposure level to the structure's occupants. The agency notes that the decision to include hazardous waste quantity as a surrogate for dose in all HRS pathways and components was made when the HRS was last revised in 1990 (see Section V.3 of the proposed 1988 HRS, 53 FR 51692, December 23, 1988; Section III.C of the 1990 HRS, 55 FR 51542, December 14, 1990). The decision was based on the concept that determining an accurate dose that receptors would be exposed to was beyond the scope of information available after a site inspection. It is not possible to accurately predict the hazardous substance concentration that receptors would be exposed to over a representative exposure period based on information collected during a site inspection due to the variability in exposure levels over time and space. Instead, hazardous waste quantity is used as a surrogate for dose in the sense that the quantity of the hazardous substances is at least qualitatively correlated to the magnitude of the exposure. Furthermore, using the structure size to project a hazardous waste quantity in the SsI component is representative of the likelihood a target could be exposed to hazardous substances, as a target may be exposed to any portion of the indoor air within the structure; much in the same way a target may be exposed to a portion of all the contaminated soil in the soil exposure component, a portion of the contaminated sediments or surface water in the surface water pathway, and a portion of the contaminated ground water in the ground water pathway.*

Comment	Response
	In addition, the method for calculating this factor is consistent with the use of hazardous waste quantity in all other HRS pathways and components and was found to be acceptable given the restraints of the use of site screening data when the HRS was reviewed by the U.S. Court of Appeals for the D.C. Circuit. See Eagle-Picher Industries, Inc. v United States Environmental Protection Agency, et al., 759 F.2d 905 (D.C. Cir. 1985) (holding that EPA has clearly indicated the limitations of the HRS model and that the agency intends to use the HRS to determine if a site warrants further assessment, not whether a site warrants response action under CERCLA). EPA also notes that the commenter did not suggest an alternative method of determining the hazardous waste quantity from information collected during a typical time-limited screening assessment that would increase the accuracy of the SsI component. *The agency also notes that the HRS is intended as a screening tool, not a site-specific risk assessment, and as indicated by SARA, need not meet the requirements of a site-specific risk assessment, only to ensure "to the maximum extent feasible" it accurately assess relative risks associated with actual or potential releases of hazardous substances from a site. Specifically, as noted in the conference report for SARA, "This standard does not, however, require the Hazard Ranking System to be equivalent to detailed risk assessments, quantitative or qualitative, such as might be performed as part of remedial actions. ...Neither the revised Hazard Ranking System required by this section nor any other provision of law or regulation requires the conduct of risk assessments at unlisted or listed facilities." (House Conference Report No. 99-962, 99th Cong. 2nd Sess. at 199-200, (1986)).* *Regarding the commenter's request that EPA delay promulgation of the rule until guidance for implementation of the SsI component is developed, EPA does not agree that promulgation of the HRS SsI Addition needs to be delayed. Guidance on implementation of the HRS SsI Addition was not necessary for evaluating the SsI component, which is a scoring mechanism not procedures for data collection. Any future guidance developed will provide details on collecting data to support an HRS SsI evaluation. EPA also notes that to delay addressing sites that may pose a significant human health risk until all necessary guidance documents have been developed would not be consistent with EPA's mandate to protect human health.* *Regarding the commenter's request to revise the Hazardous Waste Quantity factor evaluation in the SsI component, the SsI component does consider the proportion of the released mass of hazardous substances that could enter regularly occupied structures. Specifically the hazardous waste quantity value for the SsI component only includes estimates of the amount of hazardous substances that could enter structures within an AOE or ASC. However, to try and project the amount of hazardous substances that would enter the structures based on concentrations in the subsurface with any confidence would require both long-term sampling to reflect the variability in hazardous substance concentrations, and the use of fate and transport models that would require site specific structural information, subsurface geologic information, and climatic conditions. As explained in the preamble 1990 HRS (55 FR 51532, December 14, 1990) and therefore, requires data that could not be collected during a limited site screening investigation.*
EPA Policy Language: For Tier A, hazardous constituent quantity, use the mass of constituents found in the regularly occupied structure(s) where the observed exposure has been identified. **Proposed Revision / Comment:** The meaning of the term "adequately determined" is unclear, because although a few rounds of indoor air sampling is not considered enough to adequately determine exposure, it appears that in many cases even concentrations >100-times a screening level would not lead to a substantial hazardous constituent quantity under Tier A.	*The discussion of when Tier A has been adequately determined with reasonable confidence is an appropriate topic for discussion to be included in any future guidance. EPA notes that the actual phrase in HRS Section 2.4.2.1.1 Hazardous constituent quantity, of the HRS is "is known or is estimated with reasonable confidence'.*
EPA Policy Language: For Tier B, hazardous waste stream quantity, use the flow-through volume of the regularly occupied structures where the observed exposure has been identified. **Proposed Revision / Comment:** In Tier B, it appears based on Figure 5-2 that the hazardous waste quantity is directly proportional to the airflow through the building. In other words, the more air exchange the building has the larger the hazardous waste quantity will be and the higher the HRS score. This is not defensible for indoor air and VI because the concentration, not the	*Concerning the commenter's statement that the hazardous waste quantity is directly proportional to the airflow through the building, the approach in the HRS to estimate a site's hazardous waste quantity results in a value that is directly related to the amount of hazardous substances to which a receptor may be exposed. EPA agrees that this approach is imperfect. At many sites only a rough estimate of the actual quantity of hazardous substances released can be determined. EPA considers it unlikely the accuracy of the estimate can be improved based on the level of information available after a screening evaluation. Therefore, EPA considers that the current approach is sufficient to reflect any significant differences in the amount of hazardous waste located at different sites.* *Regarding the comment on using a one week period to calculate the airflow through a building, the referenced section is only an example used to*

Comment	Response
mass flow through the building is what actually produces the exposure. In other words the exact same human exposure would be scored very differently depending on the air exchange rate of the building. The basis for using the mass flow through the building in a one week period for screening is unclear. DoD suggests this is analogous to calculating waste quantity by multiplying the tap concentration in a drinking water system times the amount of drinking water produced in a week. As discussed above, DoD suggests EPA consider how tier B is handled for other pathways as a potentially better model than following the soil pathway example as they have done.	*illustrate how to calculate Tier B, it is not a requirement that a one-week period be used to perform this evaluation, nor would such a calculation represent the total wastestream flow that an individual might be exposed to if the building was occupied for a longer period. EPA agrees with the commenter's statement that the concentration of a hazardous substance, and not the total quantity of air within a building, is what actually represents the dose of hazardous substances an individual might inhale. However, a time-limited screening assessment, such as that performed as part of an SI, or even an ESI, is unlikely to produce an actual estimate of dose; therefore, the HRS, which is a screening tool based on a time-limited screening assessment, cannot be written with the assumption that such data will be available. Tier B (as well as Tier A) was developed in the event the required data necessary to evaluate the tier is available. It is not expected that a complete Tier B evaluation will commonly be used to evaluate the hazardous waste quantity at a site.* *In addition, the commenter's statement concerning the SsI component's Tier B evaluation is analogous to using concentrations in drinking water is incorrect, in that concentrations of hazardous substances are not used in performing a Tier B estimate. Tier B is evaluated with the SsI component in a similar manner to the other HRS pathways and components; the hazardous wastestream is defined in HRS Section 1.1, Definitions, as "material containing CERCLA hazardous substances (as defined in CERCLA 101[14]) that was deposited, stored, displaced, or placed in, or otherwise migrated to, a source." Tier B is an estimate of the amount of the total wastestream, not the amount of hazardous substances in the wastestream.*
EPA Policy Language: For Tier C, volume, use the volume divisor listed in Tier C of Table 5-18. Volume is calculated for those regularly occupied structures located within areas of observed exposure with observed or inferred intrusion and within areas of subsurface contamination. **Proposed Revision / Comment:** It is unclear how the height of the ceilings within a building becomes a consideration in determining vapor intrusion risk. For example, the volume of air inhaled by a human is not related to the ceiling height and is always small with respect to the volumetric flow rate through the building. In other words the availability of more contaminated air within the building to be breathed does not increase the risk. EPA is saying that the more air there is in the building, the greater the opportunity for inhalation. But this doesn't take into account that the amount of exposure is directly proportional to the number of people in the buildings, which is already accounted for under targets. People don't breath more air because they are in a large building. Because of air exchange, concentrations in buildings are not meaningfully affected by the amount of inhalation that has already occurred.	*In response to the commenter's question of how the height of a ceiling is a consideration in determining vapor intrusion risk, the height of a ceiling is only used to help determine the volume of a regularly occupied structure. The height of the ceiling itself is not a direct consideration in the determination of a hazardous waste quantity. Tier C (which is based on a structure's volume) represents the volume of contaminated air present at a site. EPA considers this a reasonable surrogate for the quantity of waste at a site when more detailed information regarding the quantity of the waste is not available. EPA agrees that the hazardous waste quantity factor is not a perfect surrogate for dose and that the relationship between hazardous waste quantity and exposure levels in the SsI component is not exact. However, there is at least a qualitative relationship between the amount of subsurface intrusion contamination into a structure and the level of exposure to the structure's occupants. The concentration or dose a person may inhale, or has inhaled in the past, would be zero if no subsurface intrusion had occurred, and would increase as the amount of intrusion increases. EPA agrees that the correlation between the hazardous waste quantity and risk would be more accurate if the impact of other factors could be quantified, such as air exchange rates and dilution of the contamination due to other factors (e.g., the percent of air entering the structure due to open doors and windows), but this level of information is unlikely to be available when an HRS evaluation is performed.* *In addition, the method for calculating this factor is consistent with the use of hazardous waste quantity in all other HRS pathways and was found to be acceptable given the restraints of the use of site screening data when the HRS was reviewed by the DC District Federal Court of Appeals (the Court with jurisdiction over rulemakings under CERCLA). See Eagle-Picher Industries, Inc. v United States Environmental Protection Agency, et al., 759 F.2d 905 (D.C. Cir. 1985) (holding that EPA has clearly indicated the limitations of the HRS model and that the agency intends to use the HRS to determine if a site warrants further assessment, not whether a site warrants response action under CERCLA).In addition, using the building size to project a hazardous waste quantity in the SsI component is representative of the likelihood a target could be exposed to hazardous substances, as a target may be exposed to any portion of the indoor air within the building; much in the same way a target may be exposed to a portion of all the contaminated soil in the soil exposure component, a portion of the contaminated sediments or surface water in the surface water pathway, and a portion of the contaminated ground water in the ground water pathway.* *EPA notes that the commenter did not suggest an alternative method of determining the hazardous waste quantity, which could not already be used to determine a Tier A estimate, that would increase the accuracy of the SsI component. The commenter's suggested approach for determining a hazardous waste quantity was to incorporate consideration of contaminant concentration, which is already a key element in determining a Tier A estimate.* *Regarding the commenter's assertion that the amount of exposure is directly proportional to the number of people in the structures, the presumption regarding exposure as it relates to the hazardous waste quantity is that the greater the volume of possibly contaminated air, the greater the likelihood of an individual being exposed to a hazardous substance. For example, a large number of people are likely to occupy a large structure. The hazardous waste quantity factor value is only meant to allow a relative comparison to be made between sites with large and small quantities of waste, and is not meant to reflect a specific level of risk. EPA agrees that the population of people actually or potentially*

Comment	Response
	exposed to a hazardous substance is also represented in the targets category value. In an HRS evaluation the hazardous waste quantity is used to reflect the dose to which any individuals within a structure may be exposed, and the targets factor category value represents the number of individuals that may be exposed to that dose. As the HRS is a relative risk comparison amongst sites, and as an HRS site score does not reflect a quantitatively accurate measure of site-specific risk, EPA does not consider any perceived overlap between these factors to negate the HRS relative rankings amongst sites.
EPA Policy Language: Table 5-18, Hazardous Waste Quantity Evaluation Equations for Subsurface Intrusion Component **Proposed Revision / Comment:** Previous DoD comments have noted that the type of information needed for this evaluation (and generally not gathered at the PA/SI) will likely lead to high uncertainty. Tier A estimates can be easily calculated if indoor air data are available; however, it is not a rational measure of waste quantity. Although estimates using tier B could be calculated with the tabulated air exchange rates, they are not a rational measure of waste quantity. Tiers C and D involve counting and measuring buildings and can be readily implemented; however, the relationship between building size and waste quantity has not been justified. This is somewhat analogous to using the body weight of a person drinking contaminated water as an index of hazardous waste quantity, which does not make sense.	*It is unclear what the commenter is referring to when stating the hazardous waste quantity evaluation will lead to "high uncertainty", or that Tier A is not a rational measure of waste quantity. However, EPA has reviewed all of the commenter's specific comments on the evaluation of hazardous waste quantity and provided responses below and elsewhere in this document.* *If the commenter is asserting that the hazardous waste quantity estimation process is not rational, and that EPA should not be using a measure of the quantity of contaminated air in a structure as a factor in HRS scoring because the actual factor that has a relation to risk is the concentration or dose to which a receptor is exposed to, EPA disagrees. EPA agrees that hazardous waste quantity may not be a perfect surrogate for dose at some sites. However, as explained in responses to other DoD comments, it is unlikely that any actual projection of dose that receptors may be exposed to can be estimated with reasonable confidence at all sites that may be evaluated using the HRS. The level of data necessary to make such an estimate will simply not be available at most sites and is beyond the scope of a time-limited screening assessment to collect. At some sites where the release occurred in the past, this information will often likely never be available. EPA also notes that the commenter is again proposing collection of data, including sufficient data to determine actual representative contaminant concentrations at a site, which would be used to perform a site-specific risk assessment. As a result, the commenter is again asserting that data equivalent to that which could be used to perform a site-specific risk assessment should be used to identify sites for the NPL. This was not Congress' requirement for the role of the HRS. The role of the HRS is to identify sites warranting further investigation (i.e., placement on the NPL). In the CERCLA site assessment process, collection of the level of data required to perform a site-specific risk assessment occurs during an RI, which is typically performed after placement on the NPL. If this level of data were required to rank sites using the HRS, any further investigation, such as an RI, would not be needed.* *Instead, EPA continues to consider it reasonable to rank sites with larger waste quantities as a higher priority for further investigation higher than sites with lower waste quantities.* *Regarding the overall HRS hazardous waste quantity tiering system, as discussed in the preamble to the proposed 1988 HRS (53 FR 51972 - 51973, December 23, 1988), EPA developed a tiered system of determining the hazardous waste quantity to better reflect the amount of hazardous substances in the waste. EPA recognizes that, at some sites, sufficient data may be available to determine the concentration of hazardous constituents and the HRS directs EPA to use these data where they are available. At most sites, however, obtaining these data would be difficult and costly.* *The tiered system for evaluating hazardous waste quantity was designed to encourage the use of concentration data while providing the flexibility to use indirect estimates of a constituent's mass when sufficient concentration data are unavailable. The tiered approach involves the development of a waste quantity factor value based, in order of preference, on three methods of hazardous substance quantity estimation: 1) hazardous constituent quantity, Tier A; 2) site wastestream quantity, Tier B; and 3) site disposal capacity, Tier C, Volume and Tier D, Area.* *In addition, when data to support the actual quantity of hazardous substances having entered or entering into regularly occupied structures on site are complete and accurate, the hazardous constituent quantity, Tier A, provides the most accurate determination of the quantity of hazardous substances at the site.*
EPA Policy Language: For those regularly occupied structures and regularly occupied tenant spaces in a multi-tenant structure that are located within an area of observed exposure for which subsurface intrusion is inferred, or if there is an observed exposure by direct observation only, assume Level II concentrations. **Proposed Revision / Comment:** Please clarify how to perform this analysis [the assignment of Level II concentrations for structures based on inference of subsurface intrusion or an observed exposure by direct observation] if there are no indoor air sampling	*If a regularly occupied structure is within an AOE, the assignment of Level II concentrations does not require the presence or collection of indoor samples, nor does it require collection of subsurface samples, to perform the analysis. The SsI component assigns Level II concentrations to any regularly occupied structure within an AOE not already assigned as having Level I concentrations. Regarding the commenter's scenario where there is no indoor air data, an AOE cannot be established (see HRS Section 5.2.0 General Considerations, for further information).*

Comment	Response
data, and if there are only soil or groundwater data available.	
Proposed Revision / Comment: Numerous typos occur throughout the document. EPA is encouraged to conduct a thorough QA/QC of the document before finalizing.	*EPA has reviewed and revised the final Technical Support Document included in the rule docket for this rulemaking.*
EPA Policy Language: Root Mean Square formula. **Proposed Revision / Comment:** Equation contains parameter S_{se} that is not defined in text. Define parameter.	*"S_{se}" has been defined as the Soil Exposure component in Section 2.1, Current Structure of the HRS (i.e., pathway level description), of the final TSD for the HRS SsI Addition.*
Proposed Revision / Comment: Limited discussion of "alternate or preferred methods" has been added to section 4.0 in the most recent version of the TSD. However, a clearer explanation of how these tools could be used for attribution is suggested. Section 4.0 completely omits consideration of real time data acquisition by such means as portable GC/MS and forced depressurization with confirmation by pressure transducers. Real time screening with forced depressurization and portable GC/MS instruments (e.g., Hapsite) is far more conducive at SI stage evaluations applicable to the HRS than are summa canisters and repeated deployments, etc. and should be discussed among the lines of evidence. Comprehensively discuss using real-time data acquisition methods, specifically the use of portable GC/MS in combination with forced depressurization.	*Regarding the commenter's suggestion that EPA provide a clearer explanation of tools that could be used for attribution, EPA considers such information inappropriate for inclusion within the TSD. The purpose of the TSD is to explain the rationale behind the SsI component, and to illustrate the HRS scoring mechanism, not to provide guidance or to describe how the data for an HRS evaluation is to be collected. The TSD provides some examples of how technology and data may be used to collect the data necessary to perform an SsI component evaluation and to illustrate how the HRS scoring is performed, but is not intended to be a comprehensive list or guidance of ways to obtain data for an HRS evaluation. The HRS also does not provide prescriptive methods for performing site investigations for any HRS pathway evaluation because the methods used during the collection and analysis of environmental samples depend on site-specific conditions, could not be written to cover all possible situations, and could become outdated in the future. However, because every site is different there will be no specific requirements for how data is to be collected for an HRS evaluation, only guidelines. This variability in sites exists for all HRS pathways.*
EPA Policy Language: In addition, actions should be taken to ensure that sources of the hazardous substances inside a structure (e.g., household chemicals) have been removed from the structure prior to sampling. **Proposed Revision / Comment:** With the very short duration usually afforded for a PA/SI (EPA has stated 1-2 days), it is unclear how this step could reasonably be accomplished with equal certainty that all sources (glues, paints, thinners, aerosols, etc.) could be removed with sufficient time to let the indoor air equilibrate before measurements are taken. Source attribution for indoor air is an incredibly complex, multi-step process--it seems unreasonable that a credible evaluation could take place without a more substantial input of resources as well as time. The current EPA 2015 guidance generally recommends an indoor air sampling delay of 24-72 hours following the removal of interior hazardous sources. This procedure has been shown to be impractical at some residential studies and is often not feasible in operating industrial buildings. Incomplete attempts to remove indoor sources can be deceptive when interpreting data. Furthermore, recent field and modeling studies have indicated that interior sources of chemicals can impact subslab soil gas and the impacts can persist for longer than the typical delay time (i.e., 1-2 weeks).	*EPA disagrees with the commenter's assertion that the time required for the removal of possible indoor air sources of hazardous substances from a structure, and equilibrium of the structure's indoor air prior to sampling, could not occur during a time-limited screening assessment. Nothing in the NCP, which contains the regulations regarding SIs, establishes that a specific time period of 7-10 days are required to remove the influence of indoor anthropogenic sources; this can be specified in the design of the sampling plan for an SI. EPA notes that in past and current SsI sampling efforts, EPA has asked residents to remove such sources when obtaining permission to sample on properties and within structures, and then verifies this action was taken when the actual sampling event occurs. If procedures for removal of anthropogenic sources of hazardous substances when establishing background levels cannot be accomplished, establishing attribution of the increase in contamination due to subsurface intrusion must be accounted for in the establishment of attribution using multiple-lines-of-evidence. This topic is appropriate for any future guidance on the implementation of the SsI component.*
EPA Policy Language: Table 4-6, Effective Porosity/Permeability of Geologic Materials **Proposed Revision / Comment:** What about fractured rock aquifers that aren't considered highly permeable? It's unclear how the effective porosity/permeability of fractured rock environments quantitatively translates to the appropriate score. Quantitative criteria should be established applicable to common hydraulic conductivity measurements (e.g., slug	*In response to the commenter's concern regarding fractured rock aquifers that are not considered highly permeable, low permeability fractured igneous and metamorphic rocks were assigned a porosity/permeability value of 3 in HRS Table 5-14, Effective Porosity/Permeability of Geologic Materials. This value has not been changed in the promulgated SsI component.* *Regarding the commenter's suggestion on using site-specific testing, the promulgated SsI component was revised to include the use of actual site-specific hydraulic conductivities when assigning porosity/permeability values to geologic layers if that data is available for a site, (See HRS Table 5-14, Effective Porosity/Permeability of Geologic Materials).*

Comment	Response
tests).	
EPA Policy Language: While it would result in a better estimate of relative risk to have the HRS algorithm reflect the concentration of hazardous substances in an observed exposure at a site, particularly for subsurface intrusion, it is unlikely that representative site contaminant concentrations could be obtained using data collected during a typical time-limited site inspection. **Proposed Revision / Comment:** DoD appreciates that in the most recent version of the TSD, EPA added the following: "Recent studies have identified it may be possible to determine long-term averages and/or worst-case scenarios for vapor intrusion concentrations over a short time frame using structure depressurization techniques, but further research of these techniques is ongoing. Therefore, it is not likely that a measurement taken during a short time period would accurately depict dose or the actual amount of hazardous substances that populations are exposed to. However, the proposed addition is written to use such information if the procedure becomes accepted, as such sampling results could demonstrate the structure should be considered within an area of observed exposure." However, it is still unclear how HRS users will know when these alternate methods have been shown to be acceptable. Would a published technology validation by a federal government program be considered such evidence? The current version of the TSD does not include specific guidance on how to address non-detect[s]. However, it is inferred that non-detects are "sampled structures with no evidence of contamination" in the technical support documents example scenarios.	*The acceptability of alternate data collection methods for HRS scoring purposes is a topic more appropriately addressed in any future implementation guidance following promulgation of the SsI component, not for inclusion in the TSD. The purpose of the TSD is to explain the rationale behind the SsI component, and to illustrate the HRS scoring mechanism, not to provide guidance or to describe how the data for the HRS evaluation is to be collected.* *Regarding samples with "non-detect" concentrations, the TSD is not guidance for the HRS, nor is it intended to be a substitute for guidance. The commenter is correct that in Example Site Scoring Scenario 1 in the TSD for the proposed HRS SsI Addition, "sampled structures with no evidence of contamination," represent regularly occupied structures that had indoor air samples collected that were "non-detect" for hazardous substances. In Example Site Scoring Scenario 3 "sampled structures with no evidence of contamination" represent structures with subslab samples collected that did not meet observed release criteria. The appropriate use of "non-detect" samples in an HRS SsI evaluation will vary due to site-specific conditions.*
EPA Policy Language: This proposed rule mandates only the addition to the HRS of the *capability* to rank sites with SsI threats. It does not specifically mandate how, to what sites, and under what conditions the HRS will be applied. **Proposed Revision / Comment:** How does EPA anticipate ensuring consistency for "how, to what sites, and under what conditions" the inclusion of SsI within the HRS will be applied? There are significant challenges associated with the methodology for evaluating potential vapor intrusion, and therefore, if this document does not describe "how" SsI screening should be conducted there will likely be inconsistent methods and large variation in associated costs.	*In response to the commenter's concern regarding consistency in conducting SsI evaluations, application of the HRS is an appropriate topic for any future guidance on the implementation of the SsI component. The HRS does not provide prescriptive methods for performing site investigations for any HRS pathway evaluation because the methods used during the collection and analysis of environmental samples depend on site-specific conditions, could not be written to cover all possible situations, and could become outdated in the future. However, because every site is different there will be no specific requirements for how data is to be collected for an HRS evaluation, only guidelines. This variability in sites exists for all HRS pathways.* *Regarding the comment on the variation of associated costs with investigating sites for the SsI component, the costs of an investigation are also dependent upon the specifics of the site itself. As is the case with the other HRS pathways, the level of effort required to evaluate an SsI site is expected to vary on a site-by-site basis depending on the size and extent of contamination at the site. For example, in general, the number of samples necessary to determine the areas of subsurface contamination or areas of observed contamination, are expected to be roughly equivalent to that that for establishing areas of soil contamination at a comparable size site evaluated under the Soil Exposure component. Subsurface intrusion sampling may require additional sampling and different sample types than those collected at other sites, and, therefore, may result in an increase in some site assessment costs. While the majority of subsurface intrusion site assessment costs are expected to be slightly higher than non-subsurface intrusion site assessment costs, there will be some sites where the costs are comparable to, or even less than, sites scored under other pathways. It cannot be predicted with certainty that there will be an overall increase in cost or level of effort for any particular site due to the HRS SsI Addition.* *EPA notes that the agency's remedial and removal programs, as well as states and tribes, have been evaluating subsurface intrusion threats for many years at somewhat increased expenses, but well justified considering the risks associated with indoor air contamination. Gathering the additional information necessary to evaluate these sites using the SsI component is not expected to be a significant cost expenditure over and above the typical site inspection and/or expanded site inspection.*
EPA Policy Language:	*CERCLA 105 (a)(8)(A) requires EPA to amend the HRS "to assure to the maximum extent feasible, that the HRS accurately assess the relative degree of risk to human health and the environment posed by sites and facilities subject to review." Contamination due to subsurface intrusion is a*

Comment	Response
pg. 4. The identification of a site for the NPL is intended to guide EPA in determining which sites warrant further investigation... pg. 14 The survey of EPA Regional Offices also estimates that approximately one percent of site assessments are expected to result in HRS scores of 28.50 or higher, based in part or entirely on SsI threats. **Proposed Revision / Comment:** It is not clear how this proposed revision would improve the ability to identify sites for the NPL and further investigation, given that the contaminated source zones (i.e. groundwater, soil) are already evaluated and that the evaluation of subsurface intrusion/vapor intrusion is now routine under CERCLA/RCRA and State cleanup programs. As currently written, EPA is assuming 1% of site assessments are expected to result in HRS scores of 28.5 or higher based on SsI threats. Please clarify if this is the anticipated number of "new" NPL sites that would have otherwise not scored above 28.5. A 1% increase does not appear to be a significant benefit worthy of added costs and time and reprioritization of funds away from other sites, especially given the level of effort required to "screen" for subsurface intrusion. The number of NPL sites added per year from additional SsI investigation should be added as a row to Exhibit 3-1, pg. 15 to understand actual total benefit. Note that the 1% of sites scoring >28.5 is contradicted by the numerous examples of small sites presented in the appendices [Appendix D of the TSD for the proposed HRS SsI Addition] that do score >28.5.	*known risk to human health and the ability to evaluate those risks is consistent with the CERCLA 105 mandate. Additionally, the Government Accountability Office (GAO) stated in a May 2010 report :* *EPA may not be listing some sites that pose health risks that are serious enough that the sites should be considered for inclusion on the NPL. While EPA is assessing vapor intrusion contamination at listed NPL sites, EPA does not assess the relative risks posed by vapor intrusion when deciding which sites to include on the NPL. By not including these risks, states may be left to remediate those sites without federal assistance, and given states' constrained budgets, some states may not have the ability to clean up these sites on their own...However, if these sites are not assessed and, if needed, listed on the NPL, some seriously contaminated hazardous waste sites with unacceptable human exposure may not otherwise be cleaned up.* *The HRS previously did not have a mechanism with which to evaluate the threat of vapor intrusion into regularly occupied structures prior to the SsI component. The ground water pathway is only evaluated as it pertains to the contamination of drinking water, and the soil exposure pathway only considers direct exposure to outdoor surfaces, such as contaminated surface soil. Without the SsI component, releases of hazardous substances resulting in subsurface contamination, such as in a ground water plume, could result in vapor intrusion into overlying structures and populations coming into direct contact with the contaminants. Furthermore, if the ground water was not used for drinking water, or if the contamination in surface soils is not sufficient to pose a significant risk, there is no HRS mechanism with which to evaluate the threat posed by this route of exposure, and thus, any threat of vapor intrusion at the site would go unevaluated as it pertains to the NPL.* *EPA considers 1% of sites that will score 28.50 or higher based on SsI threats to be sites that would not have received an NPL-qualifying site score prior to the promulgation of the HRS SsI Addition. Although only 1% of sites may score 28.50 or greater based on the SsI component, EPA notes that historically only approximately 3% of sites that have been assessed under Superfund have been listed on the NPL. In addition, given the large number of sites that may exist where subsurface contamination is present and could migrate into regularly occupied structures, 1% of sites may equate to a significant number of sites, and a threat to a significant number of people. Furthermore, the percentage is irrelevant in light of EPA's mission to protect human health and the environment.* *Regarding adding SsI sites placed on the NPL per year to Exhibit 3-1 of the RIA, the number of SsI sites to be promulgated to the NPL per year is unknown, therefore, Exhibit 3-1 was not modified.* *Regarding the accuracy of the projection that the HRS SsI Addition will result in approximately 1% of evaluated sites being placed on the NPL, that percentage is not contradicted by the fact that 10 of the 11 Test Sites used to test the SsI component had an estimated site score above 28.50. These Test Sites were not a representative sample of possible sites. The Test Sites were specifically selected to test the SsI component because there was documentation of vapor intrusion, as well as available data with which to test the different scoring mechanisms in the SsI component. Regarding the possible size of most sites, EPA is unclear as to how a commenter defines a "small" site, but the size of the site is irrelevant if it represents a risk to human to health.*
EPA Policy Language: pg. 16 and Appendix B, pg. B-9 *[The commenter has referenced Section 3.2.3, page16, of the RIA. However, EPA notes section 3.2.3 begins on page 17.]* **Proposed Revision / Comment:** The listed data collection items for the baseline CSM (and subsequent Options) does not discuss data quality objectives or the challenges of temporal and spatial variability for SsI investigations, and therefore, significantly underestimates the level of effort required for and challenges associated with SsI screening.	*EPA disagrees that the RIA for the proposal HRS SsI Addition underestimates the level of effort and challenges associated with conducting an HRS SsI evaluation. Specifically, regarding the commenter's assertion that data quality objectives are not considered, EPA notes that development costs associated with identifying data quality objectives for an SsI investigation would be considered as part of the project planning costs identified in the RIA (see Exhibits A-1, B-1, and B-3 of the RIA for the promulgated HRS SsI Addition for additional information).* *Regarding challenges associated with evaluating SsI threats due to issues of temporal and spatial variability in subsurface intrusion contamination, it is not assumed that at the time of an HRS SsI evaluation that the actual exposure concentrations (reflecting the temporal and spatial variability in contaminant concentrations) will be known or projected with confidence. EPA considers the sampling and level of effort required to perform an HRS SsI evaluation to be similar to that required for evaluating sites using other HRS pathways and components and to be within the scope of a time-limited screening assessment. However, EPA agrees that in some cases the scope of a typical SI may need to be expanded to collect the information necessary to evaluate the SsI threat present at a site or that an Expanded Site Inspection (ESI) to fill data gaps may be needed. Furthermore, EPA notes that during evaluation of the Test Sites (see Appendix B of the TSD for the promulgated HRS SsI Addition) data supporting the various SsI factors could usually be collected readily using available information obtained from site inspections performed prior to the development of the SsI component. As experience is gained using the SsI component, EPA will consider what subjects are appropriate to be*

Comment	Response
	addressed in any future guidance. *Regardless, EPA considers that the scope of a screening level investigation sufficient to evaluate a site using the SsI component is consistent with CERCLA as modified by SARA. SARA directs EPA to amend the HRS to ensure that "to the maximum extent feasible" it accurately assesses the relative risks associated with actual or potential releases of hazardous substances from a site. Therefore, an SI requires collection of the minimum amount of screening level information necessary "to the maximum extent feasible" accurately assesses the relative risks associated with actual or potential releases of hazardous substances from a site with a subsurface intrusion threat. Furthermore, EPA notes that in general, the number of samples necessary to determine areas of demonstrated and probable exposures (the AOE and ASC) is expected to be roughly equivalent to that that for establishing areas of surficial contamination at a comparable size site evaluated under the Soil Exposure component. Additionally, EPA notes that there are no statutory or regulatory limits on the scope or time period for an SI (see 300.420 (c) the NCP). Furthermore, as is the case with the other HRS pathways and components, the level of effort required to evaluate a site will vary on a site-by-site basis depending on the size and extent of contamination at the site. Therefore, it cannot be predicted with certainty that there will be an overall increase in cost or level of effort at any particular site due to the HRS SsI Addition.*
EPA Policy Language: 2. For sites already placed on the NPL (scored by another pathway), an early evaluation of potential SsI threats, including collection of SsI-related data, during the site assessment process would allow for a more careful consideration of such threats as part of the remedial investigation. As a result, these threats could be more quickly and comprehensively addressed (i.e., through source /soil control, ground water cleanup and/or SsI mitigation) than is currently the case. **Proposed Revision / Comment:** Please clarify whether EPA anticipates the re-scoring of non-NPL sites for SsI to occur. Given that vapor intrusion is now a standard evaluation under CERCLA/RCRA and State cleanup programs, please clarify how screening-level data could ever be used to "comprehensively" address the threat.	*The agency does not plan to initiate a comprehensive program to re-evaluate non-NPL sites using the SsI component to determine whether they would now be eligible for placement on the NPL. EPA also notes that promulgation of the HRS SsI Addition has no impact on EPA's guidelines and procedures for identifying sites for evaluation or re-evaluation using the HRS. However, sites not on the NPL may need to be re-evaluated for the NPL using the amended HRS in the future if new information, or consideration of the SsI threat or any other threat, indicates the overall threat posed by the release at the site may be unacceptable. For example, site conditions may change over time and new information or changes in science could identify the need for further investigation at a site and perhaps the need for response action. Just as for other situations when new information becomes available for any site, if EPA, a state, tribe or other federal agency determines it is appropriate to re-evaluate a site, or change its priority for further action, it can do so using its existing or future budget resources. EPA also notes that it works in consultation with the lead agency at a site, be it state, tribal, or federal, to determine the appropriate steps to re-evaluate such sites.* *Regarding the commenter's question as to how inclusion of an SsI component evaluation in the HRS, which is based on data from a time-limited screening assessment, provides a comprehensive response to the SsI threat, the agency considers the information able to be collected during a time-limited screening assessment suitable for screening for existence of a potential SsI threat and identifying those sites that are a priority for further investigation. The placement of sites on the NPL is a required step within CERCLA to make sites eligible for use of CERCLA authority and for funding of remedial investigations and cleanup of the sites to address any identified unacceptable risk using CERCLA remedial authority. Without the HRS SsI Addition, the sites that only qualify for the NPL when this threat is included in the HRS evaluation could not be addressed using CERCLA remedial authority. Therefore, without this addition EPA cannot meet its mandates under CERCLA to comprehensively address all sites posing an unacceptable risk.* *Furthermore, the agency notes that the early identification of SsI threats could result in a more timely and comprehensive investigation and remedial response to any SsI threat, as this threat can now be evaluated at an earlier stage in the Superfund process, and can also be evaluated in consideration of placing a site on the NPL, whereas previously it could not be. For example, in the course of present HRS assessments, sometimes SsI issues are coincident with a ground water or soil water contamination problem. Therefore, the promulgated HRS SsI Addition would allow EPA's site assessment program to identify and evaluate a site's potential SsI threat and proactively develop plans for investigating and remediating such threats as needed during later stages of the Superfund process.*
DoD Included a Separate Submittal Suggesting Changes to the Proposed Rule Consistent with their Comments. See Below for a Summary of the Changes and EPA's Corresponding Responses.	
Weighting of Workers DoD proposed weighting workers within an AOE and ASC based on the actual hours worked per standard work week per worker, instead of weighting workers based on two categories: full-time and part-time.	*EPA has not incorporated the suggested change into the SsI component. Based on EPA's experience in collecting data on workers at previous sites scored using the HRS, this level of information is unlikely to be available at most sites during a time-limited screening assessment. Furthermore, the hours typically worked by non-full-time employees are likely to vary considerably over time; therefore, a one-time estimate may not be representative of the actual long-term exposure situations.*

Comment	Response
Weighting of eligible populations DoD proposed creating an additional probability weighting factor for populations in the AOE (see *Table 5-XX, Weighting Factor Values for Probability of Observed Exposure Due to Potential Vapor Intrusion*, of the Revised - DoD Proposed Redline Edits Sample Site Scoring). This weighting factor considers both a measure of the strength of the establishment of attribution of the hazardous substance concentrations to subsurface intrusion, and the hazardous substance concentration in the subsurface below the AOE.	
Consideration of Strength of Attribution DoD proposed using a measure of the strength of the support for establishing that the increase in indoor contaminant levels of hazardous substances is attributable to subsurface intrusion.	*EPA has not incorporated this suggested change into the SsI component. For HRS purposes, and for all HRS pathway evaluations, attribution is either established or not established. Additionally, to add a consideration of the strength of attribution to this component alone would be inconsistent and would create an imbalance in the comparison of the relative risk between the pathways. Furthermore, DoD has not suggested, nor can EPA perceive, a viable process for quantifying the strength of attribution using the data available at the time of an HRS evaluation.*
Consideration of a Subsurface Source Strength Weighting Factor for Targets within the AOE DoD proposed using generic attenuation factors to predict indoor air concentrations based on subsurface contaminant concentrations, which would be used in assigning an additional weighting factor for populations within an AOE.	*EPA has not incorporated this suggested change into the SsI component because it requires knowledge of the actual concentrations of the contaminants in the subsurface. Based on a time-limited screening assessment EPA does not consider that these concentrations will be known with confidence, or be representative of actual exposure over time, given the spatial and temporal variability of the concentrations in the subsurface. Furthermore, EPA notes that populations with an AOE have already been demonstrated to be exposed to contaminants from subsurface intrusion (see HRS Section 5.2.1.1.1, Observed exposure for additional information on the relevant criteria) and are already assigned a Level I or Level II weighting based on whether the concentration is above a health-based benchmark. Therefore, the weighting of populations within an AOE at proposal (and as promulgated) already reflects that actual exposure had occurred and the measure of concentrations to which the populations are exposed.*
Revision of HRS Table 5-20, *Weighting Factor Values for Populations within an Area of Subsurface Contamination*, at proposal, and Weighting Factors to Further Reflect Source Strength for an ASC DoD proposed changing the factors for weighting of populations within an ASC to reflect the use of generic attenuation factors to predict indoor air concentrations above a health-based benchmark.	*EPA has not incorporated this suggested change into the SsI component because it requires knowledge of the actual concentrations of the contaminants in the subsurface. Based on a time-limited screening assessment EPA does not consider that these concentrations will be known with confidence, or be representative of actual exposure over time, given the spatial and temporal variability of the concentrations in the subsurface. Furthermore, Table 19 (U.S. Environmental Protection Agency, EPA's Vapor Intrusion Database: Evaluation and Characterization of Attenuation Factors for Chlorinated Volatile Organic Compounds and Residential Buildings. EPA 530-R-10-002. March 16, 2012) does not identify generic attenuation factors for all sample media eligible for use in an HRS SsI evaluation (e.g., subsurface soil).*
Changes in Depth Categories of Biologically Active Soils in Assigning Degradation Factors DoD proposed different depths of biologically active soil in the subsurface be used in assigning degradation factors to eligible hazardous substances.	*EPA has not incorporate this suggested change because EPA does not consider it possible to know with confidence the actual thickness of the layers of biologically active soil throughout a site based on the information obtained from a time-limited site assessment. EPA acknowledges that the depths suggested by DoD can, in some situations, be sufficient to allow significant degradation to occur. While the SsI component already assumes that biologically active soil is present at sites unless information indicates otherwise, EPA considers it appropriate to use the categories of depths identified in HRS Table 5-18, Degradation Factor Value Table, of the SsI component to ensure that the depths of biologically active soil at a site are sufficient in most situations to support significant degradation.*
Changes in Half-life Range Values in Assigning Degradation Factors DoD proposed different half-life range values be used in assigning degradation factors to eligible hazardous substances.	*EPA has not incorporate these suggested changes because the half-life range values identified in the SsI component are considered appropriate for use in an HRS SsI evaluation based on the data available from a time-limited screening assessment. EPA also performed a limited review of available biodegradation and hydrolysis half-life values for substances often found to be present in structures due to subsurface intrusion contamination to determine reasonable breakpoints for use in the degradation factor value evaluation. The presence of hazardous substances in a structure as a result of subsurface intrusion indicates that whatever level of subsurface degradation occurs, it is not sufficient to prevent the migration of a substance through the subsurface and into a structure. Furthermore, EPA notes that the commenter did not provide a rationale for changing the half-life value ranges identified in the SsI component at proposal.*
Factors Affecting Parent-Daughter Relationships in Assigning Degradation Factors	*The consideration of parent-daughter relationships in assigning degradation factors has been removed from the SsI component.*

Comment	Response
DoD proposed changes in the consideration of parent-daughter relationships in assigning degradation factors to eligible hazardous substances. The consideration of parent-daughter relationships in assigning degradation factors has been removed from the SsI component.	
7. Scoring Scenarios DoD submitted several example scoring scenarios it felt reflected errors within the SsI component algorithm.	*As stated in the response to a previous comment that referenced DoD's scoring examples, EPA disagrees that the submitted scoring scenarios using the proposed SsI component demonstrate that the SsI component can result in false-positives and false-negatives (which based on the discussion of the examples, the commenter appears to define as an HRS site score that is not reflective of the actual site-specific risk). The commenter submitted four scoring scenarios, each of which was scored using the proposed SsI component and the commenter's recommended changes to the proposed SsI component. Two of the examples evaluated using the proposed SsI component showed similar scores regardless of a difference in subsurface contaminant concentrations. The other two examples had indoor air contaminant concentrations, but in one the concentration was above a health-based benchmark, and the other below the benchmark, but again the site scores were roughly equivalent. DoD argued that the difference in subsurface and indoor air source strengths should have resulted in greater HRS site scores for the example with higher source strength. However, upon examination of the examples, the differences in the source strengths in both paired site examples were within the reported range of temporal and spatial variation found at actual sites (U.S. Environmental Protection Agency, EPA's Vapor Intrusion Database: Evaluation and Characterization of Attenuation Factors for Chlorinated Volatile Organic Compounds and Residential Buildings. EPA 530-R-10-002. March 16, 2012). Without performing long-term site-specific monitoring studies equivalent to those performed during a remedial investigation for purposes of performing a site-specific risk assessment, it would not be possible to know with confidence that the difference in the contaminant concentrations were representative of actual differences in the concentrations to which occupants of the example structures would be exposed. Because HRS site scoring is based on screening site investigations of limited duration, it is not possible at many sites being evaluated for placement on the NPL to know with confidence the site-specific exposure levels at the time of an HRS evaluation. Therefore, EPA does not consider DoD's comments on the SsI component based on these examples to be valid.*

Submitter: 0097 – Kenneth J. Kloo, New Jersey Department of Environmental Protection (NJDEP)

Public Submission Posted: 05/03/2016

ID: EPA-HQ-SFUND-2010-1086-0097

Comment	Response
I am writing on behalf of the New Jersey Department of Environmental Protection (NJDEP) to provide comments on, and endorse the addition of, a subsurface intrusion component to the U.S. Environmental Protection Agency's (EPA) Hazard Ranking System (HRS) as published in the February 29, 2016 Federal Register.	*EPA has added the SsI component to the HRS. EPA acknowledges the commenter's support for the HRS SsI Addition.*
The NJDEP has a long history of working with the HRS as the principal mechanism used to place sites on the National Priorities List (NPL) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, or Superfund) program. The subsurface intrusion pathway as a new component in the HRS would allow states and EPA to directly consider human health threats from contaminants that enter building structures through the subsurface environment, accounting for both vapor intrusion and ground water intrusion in occupied structures. As illustrated by numerous examples in New Jersey, inclusion of this pathway as part of the evaluation of sites for placement on the NPL is essential for those with serious subsurface intrusion contamination.	*EPA has added the SsI component to the HRS. EPA acknowledges the commenter's support for the HRS SsI Addition.*
The NJDEP agrees with the approach of restructuring the soil exposure pathway that already considers direct exposure to receptors. This restructured pathway, renamed the Soil Exposure and Subsurface Intrusion Pathway, will retain the two existing soil exposure threats (resident population and nearby population) as one component that keeps the title of Soil Exposure. The threat posed by subsurface intrusion is successfully added, from the NJDEP's viewpoint, as a new component of the overall soil exposure pathway for HRS score development.	*EPA has added the SsI component to the HRS. EPA acknowledges the commenter's support for the HRS SsI Addition.*
Examining the site scoring scenarios included in the rule proposal, the NJDEP concurs that those sites that should be considered for inclusion on the NPL will score above the 28.5 threshold. The NJDEP also agrees that only a small percentage of sites evaluated through the site assessment process are actually added to the NPL. This includes many sites that score above 28.5, but are remediated through other Federal or State cleanup programs due to a number of factors. Although the basic purpose and structure of the HRS will remain intact through adoption of this proposal, the addition of a subsurface intrusion component to the existing soil exposure component appropriately amends this pathway and captures risk that clearly warrants inclusion.	*EPA has added the SsI component to the HRS. EPA acknowledges the commenter's support for the HRS SsI Addition.*
The evaluation of the subsurface intrusion component through the three factor categories — likelihood of exposure, waste characteristics and targets — remains a sound approach for this component. Following the parameters outlined in Section 5.2, values assigned through the rule would result in a final calculation of an HRS score greater than 28.5 for sites with significant vapor intrusion resulting from widespread contamination in ground water and soil gas. This is especially important in urban areas where water supplies often originate from wellfields or reservoirs many miles away from the contaminated site, historically precluding these sites from NPL consideration.	*EPA has added the SsI component to the HRS. EPA acknowledges the commenter's support for the HRS SsI Addition.*
The inclusion of delineation of Area of Subsurface Contamination (ASC) noted in Figure 4 enables populations threatened by subsurface intrusion from contamination in ground water or soil gas to be factored into a component score under the proposed rule. This feature with appropriate weighting takes into account the structures where a completed vapor intrusion pathway has not been documented, but may occur over time as site conditions change. As the NJDEP has observed during long-term investigations at sites with subsurface intrusion, sporadic exceedances of indoor air health screening levels have been observed over ground water plumes due to various factors. Also, at sites where hexavalent chromium contamination is driving the health risk, chrome blooms on basement walls from impacted ground water intrusion can occur over time, and the ASC addition helps capture this risk.	*EPA has added the SsI component to the HRS. EPA acknowledges the commenter's support for the HRS SsI Addition.* *Regarding ground water intrusion into a regularly occupied structure, EPA notes contamination from ground water intrusion into a regularly occupied structure is eligible for consideration in an SsI component evaluation only if an observed exposure has been documented, with those samples eligible for use in delineating an area of observed exposure (AOE). Ground water intrusion is not eligible for evaluation within an ASC because EPA does not consider the information available from a time-limited screening assessment to be sufficient to evaluate fluctuations within the ground water table, and, therefore, the possibility for ground water intrusion to occur. See HRS Section 5.2.0, General Considerations, for additional discussion on delineating AOEs and ASCs. Additionally, see Section IV.A.1, Consideration of contaminated ground water intrusion, of the preamble for the promulgated HRS SsI Addition for additional information on consideration of ground water intrusion.*
The NJDEP supports using the health-based benchmarks for hazardous substances shown in Table 5-19: "Screening concentration for	*EPA has added the SsI component to the HRS. EPA acknowledges the commenter's support for the HRS SsI Addition. EPA*

Comment	Response
cancer corresponding to that concentration that corresponds to the 10^{-6} individual cancer risk using the inhalation unit risk. Screening concentration for noncancer toxicological responses corresponding to the reference dose (RfD) for oral exposure and the reference concentration (RfC) for inhalation exposures." These parameters are generally consistent with the NJDEP's approach through similarly developed State regulations and guidance. The use of these benchmarks to generate values for "Likelihood of Exposure" and "Targets" on the Subsurface Intrusion Component Scoresheet captures the long-term health risks the NJDEP requires to be evaluated and remedied. Continued weighting of "observed exposure," "exposed individual" and "populations" remain a critical element of component scoring.	*notes that, while some data used in assigning a toxicity factor value can also be used in setting health-based benchmarks, the health-based benchmarks are not directly used in determining the Likelihood of Exposure value.*
The NJDEP has worked effectively with EPA to address health risks posed by subsurface intrusion at several NPL sites including the White Swan Cleaners/Sun Cleaners Area Ground Water Contamination and the Mansfield Trail Dump Site. While these two sites met the criteria for NPL inclusion without a subsurface intrusion component, other sites warranting EPA involvement will only meet the HRS threshold with the addition of this new pathway. Because the number of subsurface intrusion contamination incidents reported to the NJDEP increases each year, the NJDEP strongly supports the addition of an HRS component to ensure adequate resources for those sites with pervasive vapor and ground water intrusion contamination where substantial funding will be required, regardless of risk from other pathways. Superfund provides those resources that, in limited instances, will be required to fully investigate and remediate such sites.	*EPA has added the SsI component to the HRS. EPA acknowledges the commenter's support for the HRS SsI Addition.*
The NJDEP appreciates the opportunity to comment on the proposed rule and welcomes the opportunity to participate in the implementation of the subsurface intrusion component.	*EPA has added the SsI component to the HRS. EPA acknowledges the commenter's support for the HRS SsI Addition.*

Submitter: 0098 - Jennifer Roberts, Association of State and Territorial Solid Waste Management Officials (ASTSWMO)

Public Submission Posted: 05/03/2016

ID: EPA-HQ-SFUND-2010-1086-0098

Comment	Response
States had a number of positive reviews about the proposed Hazardous Ranking System (HRS) rule revision to share with EPA. The vapor intrusion process fits with the proposed revisions because it follows the previously established rule sequencing and format. It is clear that the process that was developed integrates well into the overall HRS scoring process. The proposed rule sums the component waste quantities of all the occupied spaces in the area of observed exposure (AOE) and area of subsurface contamination (ASC). States believe that this is consistent with the approach taken for the other exposure pathways and appears to provide a sound estimate of waste quantity. One State voiced that the Vapor Intrusion Screening Level (VISL) spreadsheet focusing on calculating risk and vapor intrusion target levels is helpful for site-specific vapor intrusion risk evaluation.	*EPA acknowledges the commenter's support of the HRS SsI Addition.*
States did mention that it will be difficult to meaningfully score the vapor intrusion pathway with limited information, especially when site inspection budgets are limited. Some concerns arise when scoring sites once the Subsurface Intrusion (Ssl) component is added.	*Given the variable nature of vapor intrusion it is possible additional sampling and different types of samples beyond that of an SI performed for evaluating sites using other parts of the HRS may be required for the HRS SsI component. However, an SsI component evaluation is still designed to be used with relatively limited data; the sampling required to evaluate a site using the HRS SsI component is similar to that required for evaluating sites using other HRS pathways and components and is within the scope of a screening assessment. Furthermore, as is the case with the other HRS pathways, the level of effort required to evaluate a site already varies on a site-by-site basis depending on the size and extent of contamination at the site. Therefore, it cannot be predicted with certainty that there will be an overall increase in cost or level of effort for any particular site due to the HRS SsI Addition.*
One State did mention that the Toxicity/Degradation section (5 .2.1.2.1 *et. seq.)* is difficult to follow. In this section, there are some instances where the user is referred to earlier sections and then referred back to the later section without describing the process.	*Regarding the flow of text and internal document referencing related to HRS SsI component section 5.2.1.2.1, Toxicity/degradation, this organization is consistent with the other pathways/components of the HRS. That is, instructions that are specific to a pathway/component are housed in the section devoted to that pathway/component, whereas more general evaluation procedures that apply across pathways are contained in section 2.0, Evaluations Commons to Multiple Pathways.* *Also, EPA notes that Section 5.2.1.2.1.2, Degradation, of the HRS was revised at promulgation to make it easier to follow and implement. Specifically, the text used to assign a degradation factor has been replaced with a table (Table 5-18, Degradation Factor Value, in the HRS SsI component at promulgation) for ease-of-use. In addition, consideration of hazardous substances that can degrade into other hazardous substances (i.e., "parent-daughter" degradation relationships) has been removed from the evaluation to simplify the assignment of the degradation factor value.*
One State voiced that there were several inconsistencies between the 2015 EPA vapor intrusion guidance document *(OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air)* and the proposed rule.	*The method for prioritizing sites using the SsI component for placement on the NPL is not inconsistent with the EPA's June 2015 VI guidance; rather, the HRS SsI Addition and VI guidance serve different purposes and apply at different stages of the Superfund process when the level of site-specific information is considerably different. (Decisions discussed in June 2015 VI guidance might not be made during an HRS investigation because the information necessary to support the decision may not be available.) The VI guidance and the HRS SsI Addition work in concert to establish national consistency in the evaluation of SsI threats. Both address the threat posed by vapor intrusion and are based on the same scientific principles. However, because they are used for different purposes, the decision criteria in each were not designed to be nor do they need to be consistent in all aspects.* *The purpose of this guidance document is to guide the investigation, assessment of the threat and the need for remediation posed by vapor intrusion into structures from all sources under all OLEM (Office of Land and Emergency Management, formerly OSWER) programs—particularly actions taken under CERCLA and RCRA. The HRS is used to prioritize sites for further investigation to determine the need for response actions under CERCLA; and, the HRS SsI Addition is an amendment to the NCP, under CERCLA to allow placements of sites on the NPL based on the threat individually posed by subsurface intrusion or in combination with other contaminant migration and exposure routes. Placement of a site on the NPL is a required step for further investigation and remedial actions to take place at these sites under CERCLA. The HRS SsI Addition is not guidance and uses data collected from a screening level investigation to rank the relative threat posed*

Comment	Response
	by sites. The SsI Addition does not address such subjects as data collection and sampling procedures; the guidelines in the VI guidance document are applicable for those purposes.
While the approach for determining whether an indoor air concentration is above background is consistent with approaches described to determine background in other components of the HRS scoring system, it goes beyond the descriptions of how to determine background under the EPA vapor intrusion guidance document. The State mentioned that it will be difficult in selecting background locations for indoor air, ensuring they are free of other indoor sources or significant outdoor ambient sources, as well as determining how to sample; and the number of structures to sample, number of locations within a structure, and the number of samples to collect to discern seasonal fluctuations. Therefore, these issues are a concern for the level of effort and defensibility.	*Because background indoor air levels are likely to vary significantly depending on site-specific conditions, EPA considers the establishment of appropriate background levels for purposes of evaluating sites using the HRS SsI component an appropriate topic for inclusion in guidance. EPA notes that for HRS purposes, background levels are mainly used to determine if there has been a significant increase in indoor contaminant levels. A separate but related step, that of establishing attribution involves projecting if the increase is due to indoor anthropogenic sources or outdoor ambient sources; it is likely that multiple lines of evidence will be required to establish attribution for the SsI component. EPA considers many of the sampling methods and procedures identified in the EPA VI guidance document will also be useful in establishing both background levels and establishing attribution.*
Regarding structure containment, the State mentioned that the proposed rule provides a greater number of options in looking at building or structure specific factors in determining the potential for Ssl of vapors by allowing scores to vary depending on the type of building and the way it is constructed. However, the State highlighted that this was not contemplated in the EPA vapor intrusion guidance. It is a welcome addition to the evaluation of Ssl because it allows site specific building parameters to be used in scoring for vapor intrusion. However, it does become problematic when trying to evaluate a plume that underlies multiple structure types.	*EPA notes that EPA's VI guidance and the HRS SsI Addition work in concert to establish national consistency in the evaluation of SsI threats. The HRS SsI Addition and the guidance document both address the threat posed by vapor intrusion and are based on the same scientific principles. However, the HRS SsI Addition and the guidance document serve different purposes, and support different phases of the Superfund remedial process when the level of site-specific information is considerably different. Therefore, the decision criteria in each were not designed to be nor do they need to be consistent in all aspects. EPA agrees with the commenter's statement that because of the greater number of building characteristics that could impact an HRS structure containment factor selection, for a site including subsurface contamination that underlies multiple structure types, the HRS SsI component evaluation may be more complex than an evaluation for a simpler site.* *EPA notes that at promulgation the HRS SsI component, Section 5.2.1.1.2.1, Structure containment, includes that for regularly occupied structures with unknown containment features, a structure containment value of greater than zero is assigned for the purposes of evaluating targets. (As mentioned in the preamble to the HRS SsI Addition at promulgation, section IV.A.4., Modifications Made to Section 5.2.1.1.2.1, Structure containment and Table 5-12, the containment value for a structure with a containment factor value of greater than zero based on unknown containment features cannot be used in assigning a potential for exposure factor.)* *EPA also notes that it is not possible to address all site-specific situations in the SsI component. This topic may be appropriately addressed in any future implementation guidance following promulgation.*
One State brought up that section 5.2.1.1.2.1, which highlights populations in structures that show no possible Ssl route, is not evaluated in the new component. The proposed rule includes populations in regularly occupied structures within an ASC where indoor air sampling has demonstrated that no observed exposure has occurred. With that, the State believes that the proposed rule may be utilizing differing sets of criteria to establish whether populations in occupied structures are potentially exposed.	*The commenter may be misinterpreting language in the preamble pertaining to the containment factor. Populations in structures within an ASC for which no indoor air observed exposure has been demonstrated are not inherently restricted from scoring. Neither the preamble to the HRS SsI Addition at promulgation nor the SsI component at promulgation contain this statement.* *The commenter's statement that "populations in structures that show no possible Ssl route, is not evaluated in the new component" appears pointed at nearly identical language within the description of the containment factor in the preamble to the proposed HRS SsI Addition: preamble section VI.3.b.i, Structure Containment, which discusses HRS Section 5.2.1.1.2.1, Structure containment. The language of the proposed HRS itself, Section 5.2.1.1.2.1, Structure containment, provides specific examples of structure features resulting in various structure containment factor values, including those for which a factor value of zero (contained from subsurface intrusion) would be assigned.* *The preamble language at proposal refers to general restrictions on the scoring of target populations associated with structures that are fully contained from intrusion and would receive a containment factor value of zero. This concept was included in the HRS SsI component at proposal in sections such as 5.2.0, General considerations, and 5.2.1.1.2, Potential for exposure, and has been clarified by related language added at promulgation in sections 5.2.1.3, Targets, 5.2.1.3.2.1, Level I concentrations, and 5.2.1.3.2.2, Level II concentrations.* *The commenter has misinterpreted this language in the preamble to the proposed HRS SsI Addition to equate the absence of an observed exposure as "no possible SsI intrusion route." The lack of a documented observed exposure based on indoor air samples collected during the SI (typically a short timeframe of 1-2 days) within a structure located above an ASC does not indicate that there is no possible SsI route into the structure (or that the containment factor value is zero). It only indicates there was no observed vapor intrusion identified during the*

Comment	Response
	sampling time period. However, a structure located above an ASC may have experienced vapor intrusion at times other than when the indoor air sampling was conducted, or could experience vapor intrusion in the future, given the temporal and spatial variability of vapor intrusion. Therefore, the target populations associated with structures in an ASC are not inherently restricted from scoring by the lack of an observed exposure.
One State noted that the proposed rule does not provide sufficient information on how Ssl will be implemented and how data will be obtained to evaluate this component. The State is concerned that publication of additional guidance to clarify these issues would be after the rule is made final. This would then affect new sites where data regarding the nature of groundwater contamination has not been obtained. Therefore, it is difficult for States to provide comments on the proposed rule without being able to review the other guidance documents that intend to provide the methods of subsurface data collection. This State mentioned that the proposed rule should not be finalized until the corresponding guidance is developed for States to have the opportunity to review and provide comments.	*Promulgation of the HRS SsI Addition does not need to be delayed until guidance documents related to its implementation have been developed. This rulemaking is to add a scoring mechanism to evaluate SsI threats to the HRS—not procedures for implementation of the component into the overall Superfund site assessment process or for the data collection for an SsI component evaluation. As shown in the scoring of 11 Tier 1 sites identified in the technical support document for the rulemaking (the January 14, 2016 document, Technical Support Document for U.S. EPA's Proposed Rule for Addition of a Subsurface Intrusion Component to the Hazard Ranking System, or TSD), sufficient information was available based on a screening level investigation of these sites performed prior to the development of this component to adequately evaluate these sites for the purpose of determining that the SsI component functions in a manner consistent with the other threats, components, and pathways in the HRS, while taking into account the unique parameters impacting the probability of exposure to subsurface intrusion. Additionally EPA notes that during evaluation of the Test Sites, data supporting the various proposed SsI factors generally had been collected using available information obtained during site inspections. Specific guidance for the implementation of the HRS SsI Addition and data collection for its scoring are appropriate topics for guidance, as such procedures may involve consideration of site-specific conditions or topics of ongoing research and development. Also, EPA notes that the EPA VI guidance document does already contain data collection methods that could be used for preliminary screening.* *Furthermore, to delay addressing sites that may pose a significant human health risk until all necessary guidance documents have been developed would not be consistent with EPA's mandate to protect human health.*
One State voiced that certain data gaps were present. These data gaps include: determination of dilution and air exchange rates in large buildings as compared to smaller residential structures; consideration of source strength in performing a Ssl evaluation; and determination of presence, extent, and characteristics of biologically active soil to weight biodegradation factors. This State is concerned that input received will be incorporated into the final rule without the additional opportunity to evaluate and comment on data collection and implementation. The State concluded by recommending that the rule should not be finalized until after States have an opportunity to review and comment on how EPA intends to implement these items as it may impact State programs.	*Regarding the "data gaps" to which the commenter refers, these were not "data gaps," but rather charge questions on three specific topics for which EPA solicited public input to determine if there were ways to improve the proposed SsI Addition at promulgation. These topics include:* • *determination of the presence and extent of biologically active soil;* • *taking into account the difference in dilution and air exchange rates in large industrial buildings as compared to smaller residential and commercial structures when calculating the hazardous waste quantity; and,* • *consideration of source strength in the HRS algorithm.* *In response to the solicitation, the agency did not receive significant feedback that resulted in major revisions to the proposed addition—only minor revisions or no revisions were made related to each topic; therefore EPA finds it inappropriate to delay the HRS SsI Addition to allow further comment on these topics. These are identified below and iterated in the specific responses to comments in the final HRS SsI Addition support document (this document):* • *In response to comments received on the subject of biologically active soil, the HRS SsI Addition is revised at promulgation to clarify the assumption of the presence of biologically soil in evaluating the degradation factor unless evidence indicates otherwise (see section 5.2.1.2.1.2 of the HRS).* • *In response to comments received on the subject of dilution and air exchange rates in large industrial buildings, EPA did not make any changes to the final HRS SsI Addition based on the comments received, as the type of information requested in these comments is generally not available during a typical site inspection. The HRS is a screening tool that uses information available during a site inspection. However, the HRS process does not preclude the use of more structure-specific data to evaluate the SsI pathway if available (e.g., in estimating a Tier A waste quantity).* • *In response to comments received on the subject of source strength, while no commenters proposed a method for determining the source strength over time or suggested specific changes to the HRS algorithm, commenters requested that EPA's attenuation factors address variability in measurements. In response, the agency revised the final HRS SsI Addition to include a higher weighting factor*

Comment	Response
	value for targets in the area of subsurface contamination (ASC) and when assigning a degradation factor when non-aqueous phase liquids (NAPLs) are present at a site. Additionally, the HRS process does not preclude the use of more structure-specific concentration data to evaluate the SsI pathway if available (e.g., in estimating a Tier A waste quantity).
One State commented on the indication that EPA mentioned that fewer assessments will be conducted per year and new sites will not be added to the National Priorities List (NPL). The State voiced concern that there will be an increased inventory of sites that would not be evaluated by EPA because of limited resources. If that happens, it could impact State resources and limit the State's ability to address other State Superfund projects. Therefore, the State would like the rule not to be finalized until after the States have an opportunity to review and comment on what EPA intends to implement.	*The subject of the commenter's concerns regarding impacts to the inventory of sites and a potential site backlog is outside the scope of the HRS SsI Addition rulemaking; promulgation of the rule will not be delayed for this subject. However, EPA expects that the allocation of available resources may be adjusted to reflect this rulemaking, but will continue to be optimized by EPA, its state and tribal partners, and other federal agencies to evaluate priority sites. This HRS SsI Addition does not change the process of prioritizing sites. Furthermore, the number of samples and level of effort required to evaluate a site using the 1990 HRS already varies on a site-by-site basis depending on the size and extent of contamination at the site and the HRS pathways being evaluated; this will not change with the addition of the SsI component.*
One State mentioned that performing preliminary assessments and site inspections on behalf of EPA will require training on how to implement the proposed rule and conduct the sampling described. Quality assurance training will also be required to evaluate analytical sampling methods and data collected for the Ssl pathway.	*This comment concerns actions outside the scope of and not relevant to this rulemaking. The subject of this rulemaking addition of the proposed HRS SsI component to the HRS, whose purpose is to add to the HRS a scoring mechanism to the HRS for evaluation of SsI threats. Following promulgation, EPA will consider the need for guidance, training, and other information tools to support implementation of the HRS SsI component.*
A State commented on the use of a carcinogenic risk level of 1 in 1 million (1x10-6) for screening purposes. Because of the uncertainty and variability associated with the Ssl pathway, as well as EPA's acceptable risk range, the State would like EPA to consider a carcinogenic risk level of 1 in 100,000 (1x10-5) for screening purposes. This is because a 1x10-5 risk level would be more useful in terms of screening, especially in terms of screening sites out that would be not be able to present an unacceptable risk.	*EPA considers the risk level of one in one million (1×10^{-6}) to be appropriate for a screening tool, and it is consistent with CERCLA's directions and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The 1×10^{-6} screening risk level questioned by the commenter is used throughout the HRS because the level is the lower end of the individual lifetime cancer risk range identified in the NCP. EPA considers that the variability and uncertainty pointed to by the commenter are reasons to maintain this risk level to be protective of public health That is, the actual risk posed by a site may actually be greater than that implied by the site data available at the NPL listing stage.* *Regarding the commenter's concern the 1×10^{-6} screening risk level will not appropriately screen out sites least likely to present an unacceptable risk, this HRS SsI Addition does not impact EPA's policy or process of site prioritization, which remain unchanged. EPA considers the 1×10^{-6} screening risk level appropriate to safeguard public health.* *EPA notes that use of this risk level in the HRS does not mean that it is a cleanup level; the risk level acceptable at a specific site is determined after a remedial investigation, including a site-specific risk assessment, is performed and remedy decisions are made.*
States commented that the preamble should explain more about why vapor intrusion should only be part of the soil category, instead of both soil and groundwater categories, or why there should not be a separate category.	*Regarding an explanation for why subsurface intrusion was added as a component to the previously existing soil exposure pathway, first, to clarify, the SsI component is included in the newly named Soil Exposure and Subsurface Intrusion pathway, which is used to evaluate targets coming into direct contact with contamination. The previous soil exposure pathway is now the soil exposure component of the newly named pathway. (That is, the subsurface intrusion component is a separate component and is not part of the soil exposure component.)* *Additionally, as noted in the preamble to the HRS SsI Addition at proposal, section V.B.2, Addition of the New Component to the Soil Exposure Pathway, "[t]he soil exposure pathway was selected for modification because its structure already focuses on populations actually coming into or potentially coming into direct contact with hazardous substances. The present soil exposure pathway addresses direct contact with contamination outside of structures. The new subsurface intrusion component also addresses direct contact with contamination that has already been demonstrated to have entered into regularly occupied structures or where the contamination is present beneath the regularly occupied structures and is likely to enter into regularly occupied structures."* *The preamble to the HRS SsI Addition at proposal further explained "[t]his is in contrast with the other existing HRS pathways, which evaluate the relative risk posed by actual or potential migration of contamination from an original release location (called a 'source' in HRS terminology) via ground water, surface water, or ambient air to other locations where exposure may occur. Given that the relative risk posed by subsurface intrusion is also due to direct contact with contamination already present in, or likely to be intruding into, regularly occupied structures and no further migration away from the existing contamination areas need occur, EPA considers it appropriate to incorporate the*

Comment	Response
	subsurface intrusion threat in the same direct exposure pathway that includes the soil exposure relative risk." *The preamble to the HRS SsI Addition at proposal also identified that "[t]he score for the restructured pathway is based on a combination of the two component scores—soil exposure and subsurface intrusion. The soil exposure component score is added to the subsurface intrusion component score to determine the pathway score. The two component scores are proposed to be additive because the populations may be subjected to exposures via both routes: The soil exposure component reflects exposures to people when outside a structure and focuses on ingestion and the subsurface intrusion component reflects exposures inside a structure and focuses on inhalation. Hence, the addition of the two component scores reflects the potential cumulative risk of multiple exposure routes and is not double counting the relative risk."* *Regarding why the SsI component is not in some manner combined with the ground water migration pathway, this is because the threat posed by subsurface intrusion is different from the threat evaluated in the ground water migration pathway. The threat posed by SsI involves relative risk of direct contact with existing contamination areas due both to intrusion resulting from groundwater contamination and subsurface soils and strata, whereas the threat evaluated in the groundwater pathway involves relative risk posed by actual or potential migration of contamination from an original release location via downward movement of contamination to into drinking water aquifers. During initial analyses of ways to include SsI considerations into the HRS, EPA considered whether the subsurface intrusion threat should be included in the 1990 HRS ground water migration pathway. However, this option was rejected mainly because the ground water pathway is focused on the threat via oral ingestion posed to people utilizing ground water in drinking water aquifers that have become or could become contaminated by contaminant migration. The ground water migration pathway does not consider the fate and transport-related impacts due to inhalation and dermal exposures resulting from direct exposure to contaminants from subsurface sources (including both contaminated ground water and other subsurface materials, regardless of whether or not the related contamination is present in a drinking water aquifer, in soils, or in geologic strata under regularly occupied structures).* *Regarding the inclusion of SsI as a component instead of a standalone pathway, there are two primary reasons for this. First, as noted, the threat posed by subsurface intrusion is similar in nature to the threat now evaluated under the soil exposure component; it is therefore reasonable to house the two together as part of one pathway centered on direct exposure. Second, this organization allows the addition of subsurface intrusion to the HRS while maintaining the fundamental structure of the HRS and the balance between the pathways/calculation of the overall HRS site score.*
One State believed that the preamble needs to explain further why vapor intrusion scoring should not include the consideration of future contaminant migration.	*If by "future contaminant migration" the commenter is referring to consideration of targets that are not part of an AOE and laterally removed from ASCs (based on the possible future lateral migration of the contamination), then this topic was explained in the TSD at proposal, section 6.1.c.iii, Consideration of Establishing a Potential Migration Zone (PMZ). In summary, the TSD noted that the confidence in the present science to accurately project or predict hazardous substance migration through the unsaturated zone is limited, and that evaluation of such future subsurface horizontal migration would rely heavily on gathering extensive site-specific data in all areas of future migration; this would present difficulty within the constraints of the relatively short time period and minimal resources available during an SI. EPA did reconsider the use of ground water modelling to project future migration of contamination via ground water and the subsequent migration into regularly occupied structures. But again, EPA concluded that the amount of site-specific information necessary to perform such predictions with reasonable confidence is beyond that which can be collected during a limited screening site assessment that is the basis for HRS evaluations. However EPA does consider that during further investigations of sites promulgated to the NPL at later stages of the Superfund process, it will likely be possible to collect the site-specific information necessary to develop models of sufficient accuracy for use in projecting future site conditions.*
States would like to have a better explanation of why the consideration of vapor-phase biodegradation was included in the "Waste Characteristics" category instead of the "Likelihood of Exposure" category.	*Regarding the placement of the degradation factor in the HRS evaluation, the consideration of an individual substance's characteristics in the waste characteristics factor category is consistent with other HRS pathways and components.* *Whether a substance will degrade depends on both the substance and site-specific conditions, e.g., while the ability of a substance to degrade in the environment can be predicted based on its characteristics, whether it actually degrades is dependent on site-specific conditions. The site-specific conditions that can affect the rate of degradation can be extremely variable in time and location (e.g., oxygen content, moisture, soil matrix) and it is beyond the scope of a short-term site inspection to measure or predict these conditions with accuracy. Thus, a*

Comment	Response
	degradation factor was added to the waste characteristics category, which reflects the chemical properties of the substances at a site. *Moreover, whether the degradation factor is put in the likelihood of release or waste characteristic factor category, the impact of the factor on the score would be similar: the lower the factor, the lower the component HRS score.*
States believe that they will need to consider the risk assessor review and discussion of the approach early on to make sure they accurately assess ASC's, AOE's, and more.	*EPA agrees that professional judgment must be exercised in considering available site-specific information such as when applying the SsI component in establishing the extent of ASCs, and AOEs. This is the case for all pathways and components of the HRS. EPA notes that in some instances, such considerations are explicitly built into the HRS itself (e.g., in inferring contamination in AOEs, ASCs, and some hazardous waste quantity factors, language such as "unless available information indicates otherwise"). EPA notes that the EPA VI guidance document does identify factors could be considered in this process.*
Some States define a complete pathway differently than what is described in the new guidance. With that, EPA's approach is more accurate but is more complicated.	*Comments on the content of EPA's VI guidance are outside the scope and not relevant to this rulemaking. This rulemaking deals only with the addition of the HRS SsI component to the HRS.*
One State mentioned that the proposed rule explains that occupants of occupied structures within the ASC can be included as targets in cases where existing data indicate that there are no documented or observed exposures in the ASC. The State voiced that considering these populations as possible targets could create a high bias of the ASC value, because these populations are not exposed. With that, the approach may conflict with other pathways where existing data that documents no observed releases prevents the reviewer from inferring contamination. The Site Assessment Focus Group realizes that the proposed rule provides the framework for scoring, however, also anticipates that EPA will develop a more detailed guidance in the near future to clarify.	*Structures physically in the boundaries of an ASC, and the populations associated with those structures need not be considered part of the ASC if available information indicates otherwise. The language in the HRS SsI component at proposal, section 5.2.0, General considerations, includes the qualifier "unless available information indicates otherwise" when inferring structures to be within an ASC. Section 5.2.0 at promulgation states "[i]f sufficient data is available and state of the science shows there is no unacceptable risk due to subsurface intrusion into a regularly occupied structure located within an area of subsurface contamination, that structure can be excluded from the area of subsurface contamination." For example, a building with a structure containment factor value of zero (see HRS Table 5-12), such as a structure raised six feet above the ground surface, represents information indicating that intrusion of contaminated vapors is not likely to occur.* *Due to the time and resource limitations inherent to the Superfund site inspection process and the variability in subsurface intrusion rates with time, it is unlikely and impractical to expect that all occupied structures in which subsurface intrusion is occurring would be identified during a site inspection sampling event. Therefore, as noted, the HRS SsI Addition includes in the targets factor category evaluation those populations within an ASC, which are areas where subsurface sample contamination has been documented at levels meeting observed release criteria. By inferring contamination in an ASC between sampling locations, it is not assumed that all populations within the area are equally exposed to contamination from the subsurface. Instead, inferring contamination allows sites with large populations within an area of subsurface contamination to be ranked higher than sites with smaller populations in an area of subsurface contamination.* *EPA notes that HRS observed release criteria require that the levels of contamination in the samples be significantly above background levels and some portion of that increase can be attributed to the site being evaluated. The ASC is included in the HRS evaluation because this method will allow for an area with existing subsurface contamination below structures to be evaluated for the probable intrusion of the contamination into the overlying structures.* *Regarding the commenter's assertion that this approach "may conflict with other pathways where existing data that documents no observed releases prevents the reviewer from inferring contamination," that is not the case. For example, a single soil sample from a residential yard not meeting observed exposure criteria may not be considered sufficient evidence to document that contamination is not present in other parts of the yard. Other factors, such as the mode of deposition of the contamination, and the density of the samples meeting observed contamination in the area around the yard are possible factors to consider in making such a decision. Additional examples of similar contamination inference approaches in other pathways include: the inference of contamination in identifying an area of observed contamination in the 1990 HRS soil exposure pathway (and the now-promulgated soil exposure component); in the surface water migration pathway, there is in effect an inference of contamination for the purpose of determining which targets are subject to actual contamination between the probable point of entry and the most distant downstream observed release sample; and, in the air migration pathway, there is again an effective inference of contamination in considering targets subject to actual contamination in distance categories within the most distant observed release location.*

Comment	Response
Specific Comments by Page	
Page 10380: One State voiced that it is unclear how EPA intends for maintenance to be performed for vapor intrusion mitigation systems after the specified time has ended and systems are still needed in order to address "interim" response actions. The State further explained that even with focused, aggressive mitigation approaches to remove source areas, vapor intrusion concerns related to lingering groundwater contamination make the long-term "interim" response actions possible. With that, the State seeks clarification on EPA's intent for funding the continued maintenance of the mitigation systems.	*Regarding the commenter's request that EPA specify its intent for funding ongoing maintenance of vapor intrusion mitigation systems, this question is unrelated to this rulemaking. This rulemaking deals only with the addition of the HRS SsI component to the HRS; questions on the funding of response actions are not relevant to this action which pertains to the HRS evaluation of a site for placement on the NPL. Questions regarding funding of response actions to address SsI releases would be appropriately addressed during a later phase of the Superfund remedial process when determining the response action. Therefore, this comment is outside the scope of this rulemaking and not relevant to this rulemaking. However, EPA notes that funding of response actions under CERCLA is not changed by this rulemaking.*
Page 10387: One State commented that the proposed scoring is affected by estimates of background levels in air that will be very uncertain for a number of sites and Volatile Organic Compounds (VOC) such as chloroform, tetrachloroethylene and others.	*EPA agrees that establishing a background level for indoor air can be difficult. However, this does not mean that the HRS criteria for establishing actual exposure should not be used. Methods for establishing background levels are too site-specific to be discussed in the HRS regulation (which is a scoring methodology not a sampling methodology. After the HRS was last modified, guidance for establishing background levels was refined based on actual experience gained as sites were being scored and included in guidance. EPA expects the same to occur for the HRS SsI component.* *EPA notes that comparison of background levels to actual indoor contaminant concentrations in suspected areas are used only to establish that the contaminant level in a structure is elevated (i.e., significantly different). This is only the first step in establishing observed exposure. The second step is to attribute at least a part of the significant increase to subsurface intrusion. Therefore possible limitations in the establishment of background levels can be addressed in attributing the release and the resulting exposure to the site being investigated.* *Selecting appropriate background levels is accomplished similarly to the other HRS pathways and components in that the background samples should be from the same medium and outside the influence of contamination from the site, if possible. Background levels should also account for local variability in concentrations. Discussion of background sampling, establishing background concentration levels, and accounting for indoor air sources of hazardous substances are appropriate topics for discussion in any future guidance developed for the HRS SsI Addition.*
Page 10391: EPA inquired in the preamble if there is a way to determine the presence of biologically active soil at a site during the limited investigation, and if so, what characteristics should be looked for. One State voiced that this investigation activity is beyond the scope of the Site Assessment process.	*After evaluating the comments received on EPA's public question regarding biologically active soil, EPA agrees that this investigation activity may be beyond the scope of the Superfund site assessment process. EPA has modified the final HRS SsI Addition to clarify that the HRS SsI component assumes the presence of biologically active soil to a depth of 10 feet below ground surface at all sites, unless information indicates otherwise. EPA agrees that soil moisture, oxygen levels, and pH are factors that can be used to indicate the presence or absence of biologically active soil. However, because these soil properties can vary temporally and spatially, and because the field screening investigations used to obtain site information are of limited extent and duration, data obtained during a site inspection may not represent long-term conditions. Listing a site on the NPL indicates only that the site poses sufficient threat to warrant further investigation. Once listed, a site can undergo sufficient evaluation to determine more accurately the degree of site-specific degradation that is likely to occur.*
EPA inquired further regarding waste quantity to take into account differences in dilution and air exchange rates in large buildings compared to smaller residences when calculating waste quantity. One State suggested that EPA look at some variables by developing intrusion screening values for two different exposure scenarios. The first is residential values taking into account a "most sensitive receptor" model exposed all day over a lifetime exposure period. These receptors would include a small child, someone with a compromised immune system, pregnant women and others. Another is industrial values, assuming an adult work day exposure period for 35 years. By building these particular exposure models into the intrusion screening values, accounting for the difference between large (commercial) buildings and smaller (residential) buildings may be less critical.	*EPA received several responses to this charge question. These included the commenter's suggestion of developing intrusion screening values based on exposure scenarios for "most sensitive individual" and "industrial" models. One commenter indicated that there is not a dependable way to account for the differences between large commercial/industrial structures and smaller residential/commercial structures. Another commenter noted that there are several parameters (e.g., building energy efficiency) that would impact the differences in dilution and air exchange rates and which are generally unavailable during an initial assessment. A commenter discussed developing a sliding scale based on the size of the building and the building's general use to account for the differences in contaminant clearance rates.* *EPA did not make any changes to the final HRS SsI component based on the comments received as it agrees that the type of information needed to refine the waste quantity estimate is generally not available during a typical site inspection. However, the HRS process does not preclude the use of more structure-specific data to evaluate the SsI pathway if available (e.g., in estimating a Tier A waste quantity). The HRS has also been designed so that it can be applied consistently to a wide variety of sites. The HRS is a screening tool designed to be a measure of relative risk among sites rather than absolute site-specific risk. However, EPA notes that when data to support the actual quantity of hazardous substances having entered or entering into occupied structures on site are complete and accurate, the hazardous*

Comment	Response
	constituent quantity, Tier A, is available to provide the most accurate determination of the quantity of hazardous substances at the site.
Page 10392: One State mentioned that because of the difficulties in determining the size, morphology, and concentration distribution of groundwater plumes, determining how to handle such a large, low concentration source could prove problematic. This is a scenario that is repeated frequently at older sites that were closed out many years ago, which are now being re-assessed as part of the redevelopment when vapor intrusion issues are discovered. One State voiced that it is not clear how to handle large and low concentration sources, and that should be addressed when taking into account the source strength, as it looks to be outside the standard site assumptions. Regarding contaminant source strength, one State mentioned that most times there is not a nearby source (tank release, spill, dump, landfill, etc.), but there may be a large groundwater plume underlying the area that would cause an increased risk of vapor intrusion. Having a large, diffuse source is different from having a concentrated discrete source area, which is a process area release site measured in acres.	*EPA received multiple comments in response to its charge question regarding source strength. This comment reflects the difficulty of accessing large low concentration sources and how to account for that in considering source strength. The commenter also notes that there may be a large ground water plume without a discrete source that would cause an increased risk of vapor intrusion; and that a large diffuse source is different from having a concentrated discrete source. Another commenter suggested that EPA assign a higher score when the contaminant concentration is high (e.g., when a non-aqueous phase liquid is present) to account for source strength. One commenter provided a copy of the proposed SsI Addition with suggested edits reflecting the evaluation of source strength in assigning HRS specific factors.* *After considering all comments on this topic, in the final HRS SsI component, EPA has revised the assignment of a degradation factor value (HRS Section 5.2.1.2.1.2) and the weighting factors for targets in an area of subsurface contamination (Table 5-21 of the HRS) to include consideration of source strength where NAPLs are present.* *EPA did not add consideration of contaminants at concentrations lower than those that would indicate the presence of NAPLs to be present to the HRS SsI Addition. As pointed out by several commenters, the variation in contaminant levels, both temporally and spatially, has been found to be quite significant, in the range of multiple orders of magnitude. Therefore, EPA cannot be confident that concentration measurements from a limited screening event would actually be reflective of actual hazardous substance concentrations in the subsurface throughout a site. However, the HRS process does not preclude the use of more structure-specific concentration data to evaluate the SsI pathway if available (e.g., in estimating a Tier A waste quantity).*
Page 10394: States believe that EPA's recommended attenuation factors allow for the calculation of more realistic conservative target levels.	*Regarding using EPA's attenuation factors to allow for the calculation of more realistic conservative target levels, EPA rejected this approach because, as pointed out by independent peer reviewers, the variation in the attenuation factors was found to be extremely dependent on site-specific factors; and, those site-specific individual factors that actually influence the attenuation amongst all sites could not be projected with confidence due to limitations in the data sets. Further, the variation in the attenuation factors would be compounded by the inherent variability in any measured subsurface concentration to which they may be applied (variation in contaminant levels temporally and spatially, in the subsurface, has been found to be quite significant).* *Therefore EPA had insufficient confidence in the commenter's projection method given the large variability in hazardous substance concentration levels, the attenuation factors, and in site specific conditions to accept the approach.*
One State highlighted the attenuation factors and the depth below a building foundation. The State voiced that the proposed rule specifies a depth of 150 feet below a building foundation as the depth where Ssl is no longer the issue, except in the presence of preferential pathways or certain geological subsurface conditions. However, this is different from the *OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air* document, which looks at depths to 100 feet below a building foundation. The State further noted that the proposed rule provides relative scores that vary with depth ranges between 10 and 150 feet below a building foundation, which is not contemplated in the EPA vapor intrusion guidance.	*The differences in depth to contamination that the commenter notes between EPA's VI guidance and the SsI Addition do not represent an inconsistency because the documents are used for different purposes at different stages of the Superfund process. While depth/contamination concentration profiles may be available when determining if a site needs remediation as assumed in the VI guidance, at the HRS evaluation stage this level of information is not available.* *EPA's VI guidance and the HRS SsI Addition work in concert to establish national consistency in the evaluation of SsI threats. The HRS SsI Addition and the guidance document both address the threat posed by vapor intrusion and are based on the same scientific principles. However, because the HRS SsI Addition and VI guidance support different phases of the Superfund remedial process, the decision criteria in each were not designed to be nor do they need to be consistent in all aspects.* *The purpose of EPA's VI guidance is to guide the investigation and assessment of the threat posed by vapor intrusion into structures from all sources under all OLEM (formerly OSWER) programs—particularly actions taken under CERCLA and RCRA. The HRS is used to prioritize sites for further investigation and potentially cleanup under CERCLA. The HRS SsI Addition is an amendment to the NCP, under CERCLA to allow placements of sites on the NPL based on the threat individually posed by subsurface intrusion (both contaminated groundwater and vapor intrusion) or in combination with other contaminant migration and exposure routes. Placement of a site on the NPL is a required step for further investigation and remedial actions to take place at these sites under CERCLA. The HRS SsI Addition is not guidance and uses data collected from a screening level investigation to rank the relative threat posed by sites. The SsI Addition does not address such subjects as data collection and sampling procedures: the guidelines in the guidance document are applicable for these purposes.*

Comment	Response
	Although the maximum depth considered as a cutoff depth for HRS Table 5-13 in the SsI Addition differs from that in EPA VI guidance, the SsI Addition and the guidance document are based on the same scientific principles (e.g., the widely accepted Johnson and Ettinger [J&E] model). EPA provides its rationale for the 150-foot maximum depth in the SsI Addition in the Technical Support Document (TSD) for the proposed HRS SsI Addition; this rationale is unchanged at promulgation. Page 55 of the TSD explains that "[a]s part of EPA's sensitivity analysis in developing route characteristics, it was determined that at depths of 150 feet or greater the attenuation factor did not change significantly. Therefore, the potential for exposure correspondingly did not significantly change with depths greater than 150 feet. As a result, the maximum depth considered in Table 5-13 of the proposed HRS addition was selected to be 150 feet." The sensitivity analysis referred to is further detailed on pages 53 and 54 of the TSD. *Additionally at the stage an HRS evaluation is typically performed following an SI there is insufficient data available to yield a site-specific profile of contamination vs. depth (in some instances there may only be ground water data). It is possible that yet-to-be detected contamination exists at shallower locations than those known via SI data. This is further indication that it is reasonable to set the maximum depth considered for HRS purposes lower than that for a site where a greater level of site-specific sampling results are available.* *Furthermore, sites are known to exist where the depth to contaminated ground water exceeds 150 feet and where underlying karst features that may act as preferential pathways are present to depths of 150 feet or greater (e.g., in the San Antonio, Texas area).Therefore situations do exist at sites where depths to contamination of 150 feet or greater may pose an SsI threat.*
Therefore, the State would like EPA to provide a more thorough justification for the scores associated with these [HRS Table 5-13] ranges and whether the ranges are applicable in situations other than for scoring of HRS sites.	*Regarding the comment that EPA should provide a more thorough justification for the scores associated with the HRS Table 5-13 ranges, as explained above and in the TSD, at depths below 150 feet the effect of depth on attenuation becomes less significant in projecting subsurface intrusion, and therefore the maximum depth considered in Table 5-13 of the proposed HRS addition was selected to be 150 feet. The depth to contamination factor values range from zero to 10, where increasing depth results in a lower factor value (as explained on page 55 of the TSD). The ends of factor value range were set at the ends of the depth range—a factor of zero at a depth of 150 feet, and a factor of 10 starting at zero feet. The several factor value points between zero and 10 offered in HRS Table 5-13 are evenly distributed over the depth span from zero feet to 150 feet, generally following the logarithmic curve pattern exhibited by the plot of attenuation factors vs. depth shown in Figure 4-7 of the TSD.* *Regarding the commenter's question whether the Table 5-13 ranges are applicable in situations other than for scoring of HRS sites, that comment is outside the scope of this rulemaking. However, EPA notes that the HRS purpose is quite specific and these ranges are only intended to be applied for the purpose of an HRS evaluation.*
Page 10395: States appreciated the three examples provided to illustrate sites where the score would be above, at or below 28.5. However, States voiced that they would like to have more such examples. Some of the examples recommended for addition include sites where the vapor intrusion source was only soil with no groundwater plume; sites where no indoor air sampling had been conducted at the time of scoring; or similar sites with the primary differences of certain chemicals (Petroleum hydrocarbon/Volatile Organic Compounds versus chlorinated ethenes).	*Further example site scoring scenarios are appropriate topics for any future guidance for the HRS SsI Addition and may be generated as experience is gained scoring actual sites under the SsI component.*

Submitter: 0099 - Morgan, Lewis & Bockius LLP (on behalf of the Superfund Settlements Project (SSP))

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Comment	Response
On behalf of the Superfund Settlements Project ("SSP") I am pleased to submit these comments on the United States Environmental Protection Agency's ("EPA's") Notice of Proposed Rulemaking regarding the Addition of a Subsurface Intrusion Component to the Hazard Ranking System ("Proposed Rule") 81 Fed. Reg. 10372 (Feb. 29 2016). For the reasons set forth below the proposed rule is a solution in search of a problem. EPA should not spend more of its limited resources on an unnecessary rule.	*EPA disagrees with the commenter regarding the necessity of this rulemaking. EPA considers the addition of an SsI component to the HRS necessary for the agency, and organizations performing work on behalf of EPA (state and tribal partners), to be able to address SsI (including VI) threats at sites with a priority for further investigation using its authority under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). EPA is modifying the HRS to comply with the statutory requirements in the 1986 Superfund Amendments and Reauthorization Act (SARA), which added section 105(c)(1) to CERCLA requiring EPA to amend the HRS "to assure to the maximum extent feasible, that the HRS accurately assess the relative degree of risk to human health and the environment posed by sites and facilities subject to review." Releases of hazardous substances resulting in subsurface intrusion into regularly occupied structures are a known risk to human health.*
I. Background on the Superfund Settlements Project The SSP is an association of major companies from many different sectors of American industry. It was organized in 1986 in order to help improve the effectiveness of the Superfund program by encouraging settlements, streamlining the settlement process, and reducing transaction costs for all concerned. Since its formation, the SSP has provided constructive input to EPA and other federal agencies on critical policy issues affecting the cleanup of contaminated sites. SSP representatives have also testified before Congress on many of these issues. The SSP also has played an active leadership role in the national policy debate over many Superfund issues, and has been a strong supporter of EPA's Superfund Administrative Reforms since they were announced in 1995. The members of the SSP have extensive experience in addressing the problems presented by contaminated sites. These companies have been involved at hundreds of Superfund sites across the country over the last 25 years. As just one indicator of the scope of their experience, the members of the SSP have spent well over $6 billion to investigate and remediate contaminated sites since the federal cleanup programs began.	*EPA acknowledges the stated historical role of the SSP.*
II. The Proposed Rule Is Unnecessary In reviewing EPA's Proposed Rule and the limited information that EPA has made available to the public on this topic, we find no evidence to suggest that a new Hazard Ranking System ("HRS") pathway is needed for Subsurface Intrusion (SsI). EPA still has not clearly defined the specific problem that it would solve through its HRS revisions. EPA lists four reasons why it is proposing an addition to the HRS. None of these rationales survive scrutiny. We address them in tum.	*EPA considers the addition of an SsI component to the HRS necessary for the agency, and organizations performing work on behalf of EPA (state and tribal partners), to be able to address SsI (including VI) threats at sites with a priority for further investigation using its authority under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). EPA is modifying the HRS to comply with the statutory requirements in the 1986 Superfund Amendments and Reauthorization Act (SARA), which added section 105(c)(1) to CERCLA requiring EPA to amend the HRS "to assure to the maximum extent feasible, that the HRS accurately assess the relative degree of risk to human health and the environment posed by sites and facilities subject to review."* *Contamination due to subsurface intrusion is a known risk to human health and the ability to evaluate those risks is consistent with the CERCLA 105 mandate. When the HRS was undergoing revision in response to SARA, EPA did not include an evaluation of the risk posed by subsurface intrusion, as the state of the science did not support such an evaluation at that time. As part of the development of this modification to the HRS rule, EPA identified priority sites with significant contamination due to SsI that would not qualify for possible placement on the NPL using the 1990 HRS. With the addition of the SsI component to the HRS, sites can now be evaluated more comprehensively to consider the relative risk posed by a release at a site.*
1. Current HRS Does Not Provide Complete Assessment of Relevant Risk First, EPA states that it must amend the HRS because the current HRS (40 CFR 300, Appendix A) "does not consider the threat posed by subsurface intrusion in its evaluation of relative risk posed by a site; therefore, it does not provide a complete assessment of the relative risk that a site may pose to the public." 81 Fed. Reg. 10373. While an assessment could always include more data, the current HRS identifies those sites that are the highest priority for removal and remediation. More	*The ability to consider the threat posed by SsI when evaluating a site for the NPL is consistent with the CERCLA 105 mandate to amend the HRS "to assure to the maximum extent feasible, that the HRS accurately assess the relative degree of risk to human health and the environment posed by sites and facilities subject to review." The 1990 HRS did not evaluate the risk posed by subsurface intrusion when evaluating sites for the NPL. As part of the development of the SsI component, EPA identified priority sites with significant contamination due to SsI that could not be evaluated using the 1990 HRS for possible placement on the NPL. With the addition of the SsI component to*

Comment	Response
importantly, despite spending several years developing this proposal, EPA has still failed to identify a single site that this Proposed Rule would allow to be addressed that is not otherwise already in some form of corrective action. And even if one or a handful of sites could be identified, that would hardly demonstrate that the increased expense that the Proposed Rule will generate is justified.	*the HRS, sites can now be evaluated more comprehensively to consider the relative risk posed by a release at a site.* *Regarding the commenter's suggestion that identification of "one or a handful of sites" would not justify the cost of the proposed addition, promulgation of this addition is not contingent on identifying sites that can only be placed on the NPL due to the inclusion of a subsurface intrusion component to the HRS; rather EPA is complying with the CERCLA 105 (a)(8)(A) mandate. Not having the ability to evaluate the known risk due to subsurface intrusion to human health is contrary to the CERCLA 105 mandate. Whether or not sites are identified for placement on the NPL is not relevant in terms of justification to revise the HRS. However, as part of the development of this rule, EPA identified, with the assistance of the EPA Regional staff responsible for evaluating candidate sites for an HRS evaluation, 11 priority sites, termed test sites, with significant contamination due to SsI in addition to threats from other HRS pathways. Several of these sites were already evaluated under one or more of the other HRS pathways of the 1990 HRS and did not qualify for the NPL. With the addition of the SsI component to the HRS, sites can now be evaluated more comprehensively to consider the overall threat posed by the release(s) being evaluated. Further, at least one site is currently being evaluated using the SsI component and the documentation is being prepared to support proposal of this site to the NPL as soon as this rule is promulgated. There is no other program or corrective action available to address this site.* *EPA notes that the agency's remedial and removal programs, as well as States and tribes, have been evaluating subsurface intrusion threats for many years at somewhat increased expenses, but well justified considering the risks associated with indoor air contamination. Gathering the additional information necessary to evaluate these sites using the SsI component is not expected to be a significant cost expenditure over and above the typical site inspection and/or expanded site inspection.*
"The impetus for this Proposed Rule is a 2010 statement by the Government Accountability Office (GAO) that is quoted in the Proposed Rule: > EPA **may** not be listing some sites that pose health risks that are serious enough that the sites should be considered for inclusion on the NPL. While EPA is assessing vapor intrusion contamination at listed NPL sites, EPA does not assess the relative risks posed by vapor intrusion when deciding which sites to include on the NPL. By not including these risks, states **may** be left to remediate those sites without federal assistance, and given states' constrained budgets, some states **may** not have the ability to clean up these sites on their own ... However, if these sites are not assessed and, if needed, listed on the NPL, some seriously contaminated hazardous waste sites with unacceptable human exposure **may** not otherwise be cleaned up. Id. at 10381 (emphasis added). Despite four separate qualifiers, EPA appears to have taken GAO's hypothetical as a certainty, and crafted a Proposed Rule to analyze hazardous waste sites that do not exist. In doing so, EPA overlooked the fact that the GAO report itself said that the intrusion issue was already being addressed at 13 of the "up to 37 sites" that might be listed if VI was considered in the listing process.	*The 2010 GAO Report is not the main reason for undertaking this revision to the HRS; EPA was considering the potential HRS addition prior to the report publication. The rationale for revising the HRS to add a subsurface intrusion component is EPA's statutory authority. Specifically, CERCLA 105 (a)(8)(A), requires EPA to amend the HRS "to assure to the maximum extent feasible, that the HRS accurately assess the relative degree of risk to human health and the environment posed by sites and facilities subject to review." Contamination due to subsurface intrusion is a known risk to human health and the ability to evaluate those risks is consistent with the CERCLA 105 mandate. EPA notes that while the GAO report cited that 13 of the 37 sites were already being addressed, 24 sites remain, and to not address these sites would not be protective of human health and the environment.* *As part of the development of this addition to the HRS, EPA identified, with the assistance of the EPA Regional staff responsible for evaluating candidate sites for an HRS evaluation, 11 priority sites, termed test sites, with significant contamination due to SsI in addition to threats from other HRS pathways. Several of these sites were already evaluated under one or more of the other 1990 HRS pathways and did not qualify for the NPL. However, the HRS evaluation did not include the overall threat posed by the release via the subsurface into regularly occupied structures. With the addition of the SsI component to the HRS, sites can now be evaluated more comprehensively to consider the overall threat posed by the release(s) being evaluated. Further, at least one site is currently being evaluated using the SsI component and the documentation is being prepared to support proposal of this site to the NPL as soon as this rule is promulgated.* *EPA did not include the subsurface intrusion threat in the last major HRS revision in 1990 because the technology to detect and evaluate subsurface intrusion threats was not sufficiently developed (See the 1990 HRS Final Rule Response to Comment Support Document, Comment 14E-3). For example, at that time there were no health-based benchmark concentration values for residences or standardized technologies for sampling indoor air; the precision of analytical equipment prior to computerization was limited, and associations between contaminated ground water and soil vapors were not well understood. However, it is now possible for subsurface intrusion threats to be evaluated in a more comprehensive manner. Therefore, it is now appropriate, to add the consideration of threats due to subsurface intrusion to the HRS, given the potential for direct human exposure.*
Footnote #1 While the Proposed Rule is cast as necessary to address "Subsurface Intrusion" broadly, it is clear that the Agency's justification for the Proposed Rule, such as it is, depends fundamentally on stated concerns about vapor intrusion. For example, the Agency states it has identified a total of 1,080 sites that may or may not qualify for the NPL and which are "suspected" of having a potential subsurface intrusion problem, of which all but seven are vapor intrusion sites. 81 Fed. Reg. at 10374. Thus, the soundness of this Proposed Rule clearly rises or falls on	*The point of the commenter's statement regarding justification for the proposed addition to the HRS is unclear. EPA's justification for the rule is the statutory authority under CERCLA requiring EPA to revise the HRS for evaluating the relative risk to population based on a known risk. Contamination due to subsurface intrusion is a known risk to human health and the ability to evaluate those risks is consistent with the CERCLA 105 mandate. Vapor intrusion (or VI) is the most common type of subsurface intrusion* *Subsurface intrusion can also occur through the migration of hazardous substances from contaminated groundwater directly into*

Comment	Response
whether the Proposed Rule will do anything meaningful or necessary to address vapor intrusion issues. We consequently focus the bulk of our comments on that question. We do note, however, that the implications of the Ssl assessment being focused on non-vapor intrusions are potentially enormous and unacknowledged. First, the proposal provides no serious justification for the idea that metals or other residues left behind due to Ssl present regular and serious risks. And, were that proposition true, the implications for various federal programs would be staggering - for example, what would be the implications for FEMA and related disaster agencies when dealing with inundations of homes due to floods occurring near a Superfund site? Similarly, should HUD or other public housing authorities be expected to test their housing after the water table has had a sustained rise? The fact that such activity does not currently readily occur demonstrates how unlikely such risks really are and why the Ssi pathway will contribute nothing of consequence to environmental protection."	*overlying structures. This type of intrusion is less common. Regardless of the number of VI sites or ground water intrusion sites evaluated, or projected to be evaluated, EPA promulgated this rule to be consistent with CERCLA.* *With respect to flooding, transport of contaminants via surface water into structures is not considered in the SsI component, only transport of contaminants in ground water or soil vapor underlying and intruding into structures. Additionally, consideration of contaminant transport from flooding is not new and is already addressed in the surface water migration pathway when the flooding is due to surface flow and in the soil exposure component when receding flood waters leave behind surface contamination. However, neither the surface water migration nor soil exposure pathways address contamination inside of structures. The SsI component addresses the potential for indoor exposures due to underlying contamination only... Also, EPA does not expect that there will be a significant number of ground water intrusion sites and does not expect SsI assessments to focus on this particular scenario. The SsI component was structured to include ground water intrusion in those few instances where it might apply such as in the Garfield site, where the chromium precipitate in basements was identified as a direct contact risk. Furthermore, EPA reiterates that the HRS is a screening tool for the sole purpose of evaluating sites for further investigation. The majority of sites evaluated through the EPA's site assessment program do not meet the criteria for possible placement on the NPL and are "screened out" of the Superfund Remedial process. However, a small percentage of sites cannot be addressed by other federal or state programs and are appropriate to be handled under the Superfund program. These are sites that pose an unacceptable risk to human health, and it is these types of sites for which the Superfund program is designed. Without this proposed addition to the HRS, these sites cannot be addressed effectively under CERCLA or any other nationally consistent program.*
The HRS, as currently designed, does a satisfactory job evaluating the relative risk posed by a site. This is clear because EPA still is unable to identify sites that do not currently score 28.5 (the HRS cutoff for placing sites on the National Priorities List ("NPL")) but would be listed under the Proposed Rule. The Proposed Rule does not identify a single site that is currently not receiving appropriate remediation because of the absence of the Proposed Rule; rather, EPA's proposal is full of speculative descriptions of what "might" be the case at various sites and why the Proposed Rule "may" or "might" be impactful.	*EPA disagrees with the commenter's statement that the 1990 HRS did a satisfactory job evaluating all relative risks posed by a site. The 1990 HRS did not consider the threat posed by SsI. The rationale for revising the HRS to add a subsurface intrusion component is Congress's statutory mandate to address risks to human health and the environment to the maximum extent feasible when evaluating sites for the NPL. Specifically, CERCLA 105 (a)(8)(A) (as modified by SARA), requires EPA to amend the HRS "to assure to the maximum extent feasible, that the HRS accurately assess the relative degree of risk to human health and the environment posed by sites and facilities subject to review." Contamination due to subsurface intrusion is a known risk to human health and the ability to evaluate those risks is consistent with the CERCLA 105 mandate. As part of the development of this addition to the HRS, EPA identified, with the assistance of the EPA Regional staff responsible for evaluating candidate sites for an HRS evaluation, 11 priority sites with significant contamination due to SsI in addition to threats from other HRS pathways. Several of these sites were already evaluated under one or more of the other HRS pathways and did not qualify for the NPL. However, the HRS evaluation did not include the overall threat posed by the release via the subsurface into regularly occupied structures. With the addition of the SsI component to the HRS, sites can now be evaluated more comprehensively to consider the overall threat posed by the release(s) being evaluated. Further, at least one site is currently being evaluated using the SsI component and the documentation is being prepared to support proposal of this site to the NPL as soon as this addition is promulgated.* *Promulgation of this addition to the HRS is not contingent on identifying sites that can only be placed on the NPL due to the inclusion of a subsurface intrusion component to the HRS; rather EPA is complying with the CERCLA 105 (a)(8)(A) mandate. Not having the ability to evaluate the known risk due to subsurface intrusion to human health is contrary to the CERCLA 105 mandate. Whether or not sites are identified for placement on the NPL is not relevant in terms of justification to revise the HRS.*
To the contrary of such speculation, sites with vapor intrusion that pose a significant threat to human health or the environment are already in the Superfund pipeline. Thus, they are being addressed- either through removal or remedial actions or state programs-- even without a separate HRS pathway that allows scoring for vapor intrusion issues. Despite initial claims that dozens of contaminated sites could not be listed on the NPL unless the HRS is amended, public comments filed with EPA have only ever specifically identified one (1) such site: the Garfield Ground Water Contamination site in New Jersey.	*EPA could not use its full authority under CERCLA to address human health threats at sites with SsI threats that would otherwise not qualify for the NPL without this HRS addition. For example, It could only address threats at a portion of the site with CERCLA removal authority. EPA has statutory limitations on the amount of funding and time for conducting removal actions. These limitations may restrict EPA's ability to rely on removal authority alone to fully address subsurface intrusion issues. Congress included in CERCLA Section 104 the Superfund remedial program, which can address releases that cannot be adequately responded to by the Superfund removal program.* *Regarding alternative ways to address SsI sites, EPA agrees that in many cases there are alternative ways to address some SsI sites, however not all SsI sites can be addressed under non-Superfund authorities and programs. EPA typically only considers placement of sites on the NPL when other channels have been exhausted; this will not change with the addition of the SsI component. EPA, in dialogue with other federal agencies, states and tribes, determines the most appropriate mechanism to address the threat posed by hazardous waste sites. EPA often defers sites to other EPA, state, tribal, or federal cleanup authorities, based on whether it is likely that the threat posed by*

Comment	Response
	the site will likely be adequately addressed. While some states/tribes have programs to address subsurface intrusion contamination, some do not, and those that do often have limited authority and resources, and variable remediation criteria. Many of the sites that are listed on the NPL are sites that are referred to EPA from State programs that were not able to adequately address the sites under their own authority. The availability of the federal remedial authority to comprehensively address subsurface intrusion complements and strengthens these State and tribal programs. *Other EPA programs such as the Resource Conservation and Recovery Act (RCRA) and the Brownfields program have limited authority and limited resources to address all subsurface intrusion threats. The RCRA Corrective Action/Enforcement program is only applicable at sites currently subject to RCRA permitting or sites otherwise reachable by RCRA's enforcement activities. Furthermore, RCRA is a delegated program in many states and not all states recognize subsurface intrusion as a significant issue. RCRA sites with subsurface intrusion issues may not be addressable in all states. Also, governmental entities with site-specific Brownfields assessment and/or revolving loan fund cleanup may only use grant funds on the selected eligible property. While some SsI sites may be eligible for Brownfields cleanup grants, site or property-specific limitations may not allow for permanent remediation at these sites.*
This[the Garfield] site provides no support for EPA's Proposed Rule for two different reasons: it is not a vapor intrusion site and therefore demonstrates nothing about the need to address vapor intrusion through the Superfund program and it is a site that has been listed under the current system, demonstrating that a SsI scoring pathway is not necessary. According to EPA, at the Garfield Site groundwater is flooding basements in some homes and leaving behind hexavalent chromium in the form of crystals or dust. This is not a "vapor intrusion" problem by any means. Vapor intrusion is the migration of volatile compounds from the subsurface into overlying buildings. Crystals and dust are not ""vapor,"" and hexavalent chromium is ordinarily not a volatile compound. Moreover, EPA listed the Garfield Ground Water Contamination site on the NPL, see 76 Fed. Reg. 57662 (September 16, 2011), despite the lack of any SsI pathway in the HRS, relying on groundwater issues and relying on the current scoring method. Thus, this site provides no support for EPA's claim that a new scoring pathway is needed.	*The Garfield Ground Water Contamination site provides ample support for the proposed addition. That it is not a vapor intrusion site does not mean threats at other sites where the contamination has entered into structures due to ground water intrusion cannot be addressed as a result of this rulemaking. The SsI Addition rule includes a component for evaluating subsurface intrusion, which includes both vapor intrusion and ground water intrusion. The presence of chromium residue posed a significant threat to public health at The Garfield Ground Water Contamination site; however, the site could not be evaluated under the 1990 HRS due to the lack of a mechanism to evaluate human exposure resulting from intrusion of contaminated ground water (subsurface intrusion contamination). The only viable option to place the site on the NPL was to rely on the Agency for Toxic Substances and Disease Registry (ATSDR) to make a determination that the exposure at the site posed a significant threat to public health. The decision to include sites on the NPL based on a determination by the ATSDR is made infrequently because the mechanism was designed to be used only when ATSDR designated the threat found to warrant immediate dissociation from the release and other criteria are met. This mechanism was not designed to be used at a large number of sites, and is meant to be used only when the HRS mechanism is inadequate.*
2. "Substantial" Popular Support for the Proposed Rule Second, EPA indicates it issued this Proposed Rule "because of the substantial public support for this action." Id. at 10374. Popular support, of course, does not itself give an agency authority to issue new regulations, nor does it necessarily suggest that government action is prudent. An agency that acts simply due to the volume or number of commentators, rather than due to the logic and legitimacy of the arguments presented, is by definition acting arbitrarily and capriciously. Indeed, even thoughtful public support can be based on incorrect information. At EPA's February 24,2011 public listening session, one New Jersey community group spoke at length of its support for listing the Pompton Lakes site on the NPL, and comments addressed to the Pompton Lake site make up a substantial percentage of the 40 supportive comments that EPA cites (see below). The Pompton Lakes site, however, is already being addressed under the RCRA Corrective Action program. Listing Pompton Lakes on the NPL would not provide a faster remedy or a better remedy. EPA Region 2 distributed a fact sheet on the site, making exactly this point.	*The rationale for revising the HRS to add a subsurface intrusion component is to comply with Congress's direction as stated in CERCLA as modified by SARA. Specifically, CERCLA 105 (a)(8)(A), requires EPA to amend the HRS "to assure to the maximum extent feasible, that the HRS accurately assess the relative degree of risk to human health and the environment posed by sites and facilities subject to review." Contamination due to subsurface intrusion is a known risk to human health and the ability to evaluate those risks is consistent with the CERCLA 105 mandate. The decision to revise the HRS to include a subsurface intrusion component was not driven by public support. The preamble to this rulemaking was revised to clarify that EPA's statutory authority under CERCLA and the agency's inability to evaluate sites with SsI contamination that cannot be addressed by other authorities are the main reasons for revising the HRS.* *Regarding the Pompton Lakes site, the agency has not made any argument suggesting that the Pompton Lakes site be listed on the NPL. As the commenter points out, it is already being addressed through RCRA, which the agency considers appropriate at this time. Furthermore, EPA notes that the majority of sites evaluated through the EPA's site assessment program, regardless of pathway or component, do not meet the criteria for possible placement on the NPL and are "screened out" of the Superfund Remedial process. Since EPA adopted the HRS, 52, 859 sites have been assessed under EPA's Superfund program. Of those sites, approximately 10% were considered "NPL-caliber", but were referred to a non-NPL clean-up program (e.g., RCRA, state/tribal). A total of 1,782 of the sites evaluated were placed on the NPL, as of September 2016.*
Even accepting, arguendo, that "substantial public support" is a valid reason for rulemaking, the popular support reflected in the record is not "substantial". EPA cites a total of 40 comments received after its Notice of Opportunity for Public Input (76 FR 5370, January 31, 2011) and four public listening sessions. Of these 40, an unspecified "majority" were supportive. Five states and two tribes submitted comments in support, and the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) compiled and presented input from 14 states, which showed that only 13 states supported this action. Comments opposing the HRS addition were "in general" from industry representatives but clearly also	*The lack of written support by one state does not necessarily demonstrate lack of public support for this rulemaking. It has been EPA's experience that if the public does not support a proposed EPA action, it receives copious amounts of written documentation of this lack of support. EPA did not receive overwhelming written negative support.* *The preamble to the final rule was revised to clarify that EPA's statutory authority under CERCLA and the agency's inability to evaluate sites with SsI contamination that cannot be addressed by other authorities are the main reasons for revising the HRS.*

Comment	Response
came from at least one state and others. In short, despite EPA's language purporting to show "substantial public support," at most there are only 30% of states, 2 tribes, and a small number of environmental groups and individuals that support such action. This is hardly a public mandate.	
Footnote#5 In ASTSWMO's Comment, "State J" stated "The State recommends that VI not be included as a ranking criteria in the HRS until such time as improved predictive models can be developed that can both screen-in and screen out sites, with an adequate yet not extreme factor of safety. At the present time, predictions on VI are more art than science." Comment submitted by Charles Reyes on behalf of Mary Zdanowicz, Executive Director, Association of State and Territorial Solid Waste Management Officials (ASTSWMO), EPA-HQSFUND- 20 10-1086-0048, April 14, 2011.	*EPA considers the state of the science sufficiently developed for prioritizing sites for further investigation. EPA agrees that further advances in the science will occur that will improve EPA's ability to accurately predict which sites may pose the greatest risk. However EPA considers it appropriate to move forward with this rulemaking to be protective of human health.*
Perhaps more importantly, there is considerable opposition to this proposal. Comments opposing the proposed rule were submitted by the U.S. Department of Defense and trade associations and industry groups that collectively represent thousands of manufacturers and utilities. After enumerating the types of entities that submitted comments in support of the rule, EPA dismisses the opposing comments with a single sentence: "The comments opposing the HRS addition were, in general, from industry representatives." 81 Fed. Reg. at 10374. That is, of course, simply wrong to the degree it ignores the Department of Defense. More generally, the dismissive attitude reflected in that statement calls into question EPA's objectivity in reviewing the comments that oppose the proposal.	*EPA disagrees that there is substantial opposition to the HRS SsI Addition. The commenter appears to be making arguments about the validity of this rulemaking based on a summary of results from the 2011 Notice of Opportunity for Public Input. Prior to the publication of the proposed rule, federal agencies participated in the Interagency Review and provided substantial comments, all of which were responded to in detail and incorporated as appropriate. Furthermore, the purpose of the proposed rule was to solicit comments from the public, including federal agencies for which the responses to those comments are contained in this support document. DoD was not ignored during this process and had additional opportunity to comment on the proposed and final rule. Additionally, EPA worked with DoD to address their technical concerns, which resulted in this final rule as promulgated. It has been EPA's experience that if the public does not support a proposed EPA action, it receives copious amounts of written documentation of this lack of support. EPA did not receive overwhelming written negative support.* *Moreover, the commenter is basing the argument on the preamble to the proposed rule, which simply included a summary of the results from the 2011 Notice of Opportunity for Public Input.*

Comment	Response
3. Large Scope of Vapor Intrusion Problem Third, EPA states that there is a need for the Proposed Rule because "EPA evaluated the need for this proposed addition to the current HRS by identifying the scope of the subsurface intrusion contamination problem. These efforts to identify and classify sites that **may** pose a subsurface intrusion threat have resulted in the identification of 1,073 sites that **may or may not** qualify for the NPL but are suspected of having vapor intrusion issues." Id. at 10374 (emphasis added). "The Proposed Rule does not identify the 1,073 sites or provide any details about them and the methodology for identifying them is much less than what is required to genuinely identify the true problem scope. For example, "key word searches" in the SEMS system and the ATSDR account for 328 sites but for those sites there is no accompanying data. The Proposed Rule presents no information regarding the type(s) of sites, the nature or extent of any human or ecological risks posed by vapor intrusion, or the expected costs of addressing vapor intrusion. It is further surprising that EPA has found such a high number, considering that the GAO only stated in its report that there might be 37 sites that might be eligible for listing. At the February 24, 2011 public listening session, EPA indicated that GAO obtained this estimate by calling EPA's Regional Offices and asking each Region how many sites might be eligible for listing. Moreover, EPA's own comment concedes that these sites may not qualify for the NPL, even under the Proposed Rule. In short, the 1,073 figure is much more speculative straw man than a well-considered data point on which to justify the Proposed Rule.	*Promulgation of this rule is not contingent on identifying a defined set of sites with subsurface intrusion contamination; rather promulgation is contingent on complying with the CERCLA 105 (a)(8)(A) mandate. Not having the ability to evaluate threats due to subsurface intrusion, a known risk to human health, is contrary to the CERCLA 105 mandate. Specifically, CERCLA 105 (a)(8)(A), requires EPA to amend the HRS "to assure to the maximum extent feasible, that the HRS accurately assess the relative degree of risk to human health and the environment posed by sites and facilities subject to review." The number of identified sites with subsurface intrusion contamination is not relevant in terms of justification to revise the HRS.* *However, identification of 11 sites in the context of the NPL universe is a significant number of sites that have sufficient documented risks to human health due to subsurface intrusion to warrant an HRS evaluation. To provide perspective, historically, only a small percentage of sites (about 3%) evaluated through EPA's site assessment process are selected for placement on the NPL. Further, at least one site is currently having documentation prepared to support its proposal to the NPL as soon as this rule is promulgated.* *To support the rulemaking, EPA conducted a screening-level assessment of sites with identified subsurface intrusion threats. As a first step in collecting the list of sites potentially affected by the final rule, EPA consulted with site assessment experts that work in Superfund to identify potential site candidates. EPA also reached out to state counterparts, in particular to state programs that were known to have taken a more thorough investigation of the subsurface intrusion pathway at sites. Through this process, EPA identified approximately 1,073 sites that either had shallow ground water contamination, vapor producing chemicals, nearby populations (Tiers 3 or 4) or sites with sampling data demonstrating a vapor intrusion issue (Tier 1 and 2). These sites are not currently on the NPL, and all have a potential or identified SsI threat. Within the group of sites potentially affected by the HRS SsI Addition, EPA defined four categories:* • *Tier 4: Sites identified as having a suspected SsI threat based on EPA's Superfund database and Agency for Toxic Substances and Disease Registry keyword searches, as well as EPA or state self-identification, but for which no sampling data were obtained;* • *Tier 3: Sites identified as having characteristics or evidence that indicate SsI may have occurred or will occur;* • *Tier 2: Sites identified as having an SsI threat documented by subslab, crawl space, or indoor air samples, but insufficient HRS-required evaluation factors to qualify for the NPL; and* • *Tier 1: Sites identified as having an SsI threat with documented actual exposure of a sufficient number of targets with enough other HRS-required evaluation factors to suggest the site may qualify for the NPL.* *EPA selected the Tier 1 sites for use in testing the SsI component evaluation process. The 11 Test Sites had documentation of indoor contamination due to subsurface intrusion based on actual sampling data and other typically HRS-required data. Of the 11 sites scored, 9 were projected to score 28.50 or higher using only the SsI component. One site was projected to score 28.50 or higher only by including both the scores from the SsI component evaluation and the ground water migration pathway evaluation in the site score. It was uncertain whether these sites would qualify for the NPL when they were chosen as Test Sites, as the SsI scoring process had not been developed.* *That 10 of the 11 Test Sites have a projected HRS site score of 28.50 or greater using the SsI component is not an indication that the addition of the SsI component will result in a large number of SsI sites qualifying for the NPL; this would be a possible projection if the Test Sites were chosen randomly so as to represent a typical SsI site. The Test Sites were not randomly chosen, but instead were specifically chosen because they have a documented subsurface intrusion threat at the sites and sufficient available data to test all parts of the SsI component. Appendix B of the Technical Support Document (TSD) for this final rulemaking provides a summary of these scoring evaluations.*
The somewhat more detailed information EPA provides in the Technical Support Document as to 11 sites (see Appendix D, describing "Tier 1 Sites") also does little to support EPA's case. One groundwater case described there is on the NPL already, and EPA concedes that at five sites vapor intrusion mitigation is occurring even without this Proposed Rule. Moreover, the site descriptions routinely contain the disclaimer that "sufficient data was not provided to evaluate the ground water migration pathway, surface water migration pathway, air migration pathway or soil migration pathway of the 1990	*Promulgation of this rule is not contingent on identifying a defined set of sites with subsurface intrusion contamination; rather promulgation is contingent on complying with the CERCLA 105 (a)(8)(A) mandate. Not having the ability to evaluate threats due to subsurface intrusion, a known risk to human health, is contrary to the CERCLA 105 mandate. Specifically, CERCLA 105 (a)(8)(A), requires EPA to amend the HRS "to assure to the maximum extent feasible, that the HRS accurately assess the relative degree of risk to human health and the environment posed by sites and facilities subject to review." The number of identified sites with subsurface*

Comment	Response
HRS." Thus, it is entirely possible such sites would warrant listing without the Proposed Rule. Nor is there any assessment of the degree to which state programs or guidance might already be sufficient at each site. Thus, again, it appears that this Proposed Rule is a solution searching for a problem.	*intrusion contamination is not relevant in terms of justification to revise the HRS.* *However, identification of 11 sites in the context of the NPL universe is a significant number of sites that have sufficient documented risks to human health due to subsurface intrusion to warrant an HRS evaluation. To provide perspective, historically, only a small percentage of sites (about 1%) evaluated through EPA's site assessment process are selected for placement on the NPL. Further, at least one site is currently having documentation prepared to support its proposal to the NPL as soon as this rule is promulgated.* *The Garfield Ground Water Contamination site demonstrates the need for the ground water intrusion portion of the SsI component. The presence of this residue posed a significant threat to public health; however, the site could not be evaluated under the 1990 HRS due to the lack of a mechanism to evaluate human exposure resulting from intrusion of contaminated ground water (subsurface intrusion contamination). The only viable option to place the site on the NPL was to rely on the Agency for Toxic Substances and Disease Registry (ATSDR) to make a determination that the exposure at the site posed a significant threat to public health. The decision to include sites on the NPL based on a determination by the ATSDR is made infrequently because the mechanism was designed to be used only when ATSDR designated the threat found to warrant immediate dissociation from the release and other criteria are met. This is not a mechanism that can be used uniformly and consistently. It is highly resource intensive and may not comprehensively address all chronic threats.* *Regarding the disclaimer language included in the Tier1 site summaries, "sufficient data was not provided to evaluate the ground water migration pathway, surface water migration pathway, air migration pathway or soil migration pathway of the 1990 HRS." This language simply means that data was not collected specific to the other pathways and is standard language used as part of any HRS evaluation of a potential NPL site, and not specific to the Tier 1 sites nor this rulemaking. EPA agrees that it is possible some of the sites could have been evaluated under the other pathways, some of which were evaluated under the ground water pathway also, but did not score 28.50 or higher to qualify for the NPL because the HRS factors for other pathways would not significantly contribute to the overall score. However, due to the documentation of indoor contamination due to subsurface intrusion based on actual sampling data, these are sites that without this rulemaking cannot be evaluated for placement on the NPL, despite having contributions from other pathways.* *EPA selected the Tier 1 sites for use in testing the SsI component evaluation process. The 11 Test Sites had documentation of indoor contamination due to subsurface intrusion based on actual sampling data and other typically HRS-required data. Of the 11 sites scored, 9 were projected to score 28.50 or higher using only the SsI component. One site was projected to score 28.50 or higher only by including both the scores from the SsI component evaluation and the ground water migration pathway evaluation in the site score. It was unknown whether these sites would qualify for the NPL when they were chosen as Test Sites, as the SsI scoring process had not been developed.* *That 10 of the 11 Test Sites have a projected HRS site score of 28.50 or greater using the SsI component is not an indication that the addition of the SsI component will result in a large number of SsI sites qualifying for the NPL; this would be a possible projection if the Test Sites were chosen randomly so as to represent a typical SsI site. The Test Sites were not randomly chosen, but instead were specifically chosen because they have a documented subsurface intrusion threats at the sites and sufficient available data to test all parts of the SsI component. Appendix B of the Technical Support Document (TSD) for this final rulemaking provides a summary of these scoring evaluations.* *Regarding alternative ways to address SsI sites, EPA agrees that in many cases there are alternative ways to address some SsI sites, however not all SsI sites can be addressed under non-Superfund authorities and programs. EPA typically only considers placement of sites on the NPL when other channels have been exhausted. EPA, in dialogue with other federal agencies, states and tribes, determines the most appropriate mechanism to address the threat posed by hazardous waste sites. EPA often defers sites to other EPA, state, tribal, or federal cleanup authorities, based on whether it is likely that the threat posed by the site will likely be adequately addressed. While some states/tribes have programs to address subsurface intrusion contamination, they often have limited authority and resources, and variable remediation criteria. The availability of the federal remedial authority to comprehensively address subsurface intrusion complements and strengthens these programs.*
Of course, even if sites existed that would only be added to the NPL because of the Proposed Rule, such a site is actually likely to be a poor fit for the NPL due to the response issues that a vapor-intrusion site poses. According to GAO, "[i]ntrusion of contaminated gases into indoor air may lead to fire; explosion; and acute, intermediate, and chronic health	*That some sites might pose both a significant acute risk addressable using CERCLA removal authority and a chronic risk does not mean that the site can be adequately addressed using removal authority alone. While a removal action that does address an acute risk can at times also adequately address chronic risks, it can only do so permanently if the removal action permanently reduces both the acute and*

Comment	Response
effects. " Such imminent conditions as fire risk, explosion risk, and acute health effect risks obviously cannot be left in place for years during the NPL listing process, the negotiation of an administrative order for the performance of a Remedial Investigation/Feasibility Study, the conduct of the RI/FS itself, the development of a Proposed Remedial Action Plan, the selection of a remedy, the negotiation of a consent decree for performance of that remedy, and so on.	*chronic risk, which may not be the chosen removal remedy. In addition, , there can be more than one source of a release at sites (as has been found at many of the sites placed previously on the NPL) and the removal action may only address the sources creating the acute risk., leaving those posing only a chronic risk unaddressed. Further, many sites addressed under the Superfund program use a combination of removal and remedial authority to achieve a balance of mitigation of imminent risk with long term cleanup to address the source of contamination.* *For example, EPA's Superfund removal program has the ability to quickly respond to immediate threats to public health and the environment from the release; a removal action can be implemented regardless of NPL status to eliminate or reduce the threat of a release. However, removal actions, such as installation of vapor intrusion mitigation systems, are not intended to address the source of the contamination and unless the removal program is able to remediate the source of the underlying contamination, there is no mechanism to continually monitor the site to determine if the contaminant source may have migrated to previously unaffected areas. EPA has statutory limitations on the amount of funding and time for conducting removal actions. These limitations may restrict EPA's ability to rely on removal authority alone to fully address subsurface intrusion issues. Congress included in CERCLA Section 104 the Superfund remedial program, which can address releases which cannot be adequately responded to by the Superfund removal program.* *Therefore, addressing a site with SsI issues using EPA's removal program to respond to immediate threats and the remedial program to address all unacceptable risk whether short or long term when no other programs have the authority or funding to address is an appropriate fit for the Superfund program.*
The NPL remedial program is poorly suited to address immediate or acute risks. The listing process itself often consumes several years. The RI/FS process does not begin immediately, and once it begins, it typically consumes several years more. The development of a proposed remedial action plan, and the selection of a remedy, may each take another year or two. This is simply not the way to deal with vapor intrusion that actually poses an imminent threat to human health. Even though some community groups may want to encourage the NPL listing of vapor intrusion sites -thereby triggering the groups' eligibility for Technical Assistance Grants- the long, drawn-out process of cleaning up an NPL site is simply not well-suited to address vapor intrusion concerns. By comparison, the response actions typically taken to mitigate vapor intrusion concerns are relatively straightforward. They certainly do not require years of costly studies under EPA oversight. Such measures include sealing potential vapor entry points, sub-slab depressurization, vapor barrier and passive venting for new construction, and (at commercial and industrial facilities) building pressurization/HVAC modifications. These mitigation activities are most often addressed under state and local programs.	*Addressing a site with SsI issues using EPA's removal program to respond to immediate threats and the remedial program to address the source of the contamination when no other programs have the authority or funding to address is an appropriate fit for the Superfund program.* *While the CERCLA remedial program is not designed to address immediate or acute risks, it is part of the overall Superfund program, as designed by Congress when passing CERCLA. The CERCLA program includes both a removal program, designed to address in a timely manner acute risks posed by releases of hazardous substances, and remedial program, designed to address chronic risks and other risks not addressable by CERCLA removal actions. Simply because a site may have immediate risks to a population that can be mitigated by removal actions, does not preclude it from being addressed by the remedial program; the two programs can function simultaneously.* *EPA's Superfund removal program has the ability to quickly respond to immediate threats to public health and the environment from the release; a removal action can be implemented regardless of NPL status to eliminate or reduce the threat of a release. However, removal actions, such as installation of vapor intrusion mitigation systems, are not intended to necessarily address the source of the contamination; For example, removal actions can be used as stopgap measures to break the exposure chain until a permanent remedy is implemented. In addition, CERCLA has statutory limitations on the amount of funding and time for conducting removal actions. These limitations may restrict EPA's ability to rely on removal authority alone to fully address subsurface intrusion issues. Congress included in CERCLA Section 104 the Superfund remedial program, which can address releases which cannot be adequately responded to by the Superfund removal program.* *Regarding the commenter's assertion that VI mitigation activities have most often been addressed under state and local programs, EPA agrees that in many cases there are alternative ways to address some SsI sites, however not all SsI sites can be addressed under non-Superfund authorities and programs. EPA typically only considers placement of sites on the NPL when other channels have been exhausted. EPA, in dialogue with other federal agencies, states and tribes, determines the most appropriate mechanism to address the threat posed by hazardous waste sites. EPA often defers sites to other EPA, state, tribal, or federal cleanup authorities, based on whether it is likely that the threat posed by the site will be adequately addressed. While some states/tribes have programs to address subsurface intrusion contamination, some do not, and those that do often have limited authority and resources, and variable remediation criteria. Many of the sites that are listed on the NPL are sites that are referred to EPA from State programs that were not able to adequately address the sites under their own authority. The availability of the federal remedial authority to comprehensively address subsurface intrusion complements and strengthens these programs.*

Comment	Response
4. No Other National Program Can Address This Contamination Finally, "EPA has concluded that for non-federal facilities no other national program is able to consistently and comprehensively evaluate and, if warranted, address subsurface intrusion contamination." Id. at 10375. As noted above, it is not clear that there are sites with subsurface intrusion contamination that are not currently on the NPL that would only be added due to the Proposed Rule. Moreover, the idea that some amount of impactful national consistency can be brought to bear through the Proposed Rule is fundamentally at odds with EPA's further acknowledgements that EPA does not expect this Proposed Rule to result in additional site assessments being conducted; there is the possibility that increased costs due to SsI site assessments may contribute to fewer assessments being done in the future; and that only 20 full HRS packages are annually prepared.	*Promulgation of the SsI addition to the HRS is not contingent on identifying a defined set of sites with subsurface intrusion contamination; rather promulgation is contingent on complying with the CERCLA 105 (a)(8)(A) mandate. Not having the ability to evaluate threats due to subsurface intrusion, a known risk to human health, is contrary to the CERCLA 105 mandate. Specifically, CERCLA 105 (a)(8)(A), requires EPA to amend the HRS "to assure to the maximum extent feasible, that the HRS accurately assess the relative degree of risk to human health and the environment posed by sites and facilities subject to review." The number of identified sites with subsurface intrusion contamination is not relevant in terms of justification to revise the HRS.* *However, identification of 11 sites in the context of the NPL universe is a significant number of sites that have sufficient documented risks to human health due to subsurface intrusion to warrant an HRS evaluation. Only a small percentage of sites (about 1%) evaluated through EPA's site assessment process are selected for placement on the NPL. Further, at least one site is currently being evaluated using the SsI component and the documentation is being prepared to support proposal of this site to the NPL as soon as this rule is promulgated.* *Regarding the commenter's statement that achieving national consistency in evaluating SsI sites is at odds with EPA not expecting to conduct more site assessments per year, there is no correlation between the number of site assessments and achieving national consistency in evaluating SsI sites. The type of site assessment conducted may be different with the promulgation of this rule. EPA will continue to prioritize sites, regardless of pathway, based on the potential for the highest risk to human health. There is, however, a direct correlation between the Superfund program's ability to evaluate SsI under the HRS and other programs. EPA often defers sites to other EPA, state, tribal, or federal cleanup authorities, based on whether it is likely that the threat posed by the site will likely be adequately addressed. While some states/tribes have programs to address subsurface intrusion contamination, they often have limited authority and resources, and variable remediation criteria. The availability of the federal remedial authority to comprehensively address subsurface intrusion complements and strengthens these programs.*
Further, the fundamental question as to whether an expansion is warranted does not turn on whether a "national program" exists- Congress has long-recognized, in multiple environmental statutes, that it expects a regime of cooperative federalism to govern environmental stewardship. In turn, where a problem is being effectively dealt with through other approaches, the lack of a "national program" does little to justify the step EPA proposes. Thus, even if additional sites might exist that would qualify under this Proposed Rule, such an expansion of the NPL would still take the program outside its fundamental scope or purpose and unnecessarily so.	*If the commenter is suggesting that a national program for addressing risk posed by releases of hazardous substances is being created by promulgation of this rule, the Superfund program, a national program already exists, and this rulemaking simply expands the options available to EPA to address those sites with unacceptable risk to populations. Congress through CERCLA directed the program be created and by not revising the HRS to include threats from SsI when the capability exists to do so, EPA is not being consistent with the CERCLA mandate. Furthermore, EPA, in dialogue with other federal agencies, states and tribes, determines the most appropriate mechanism address the threat posed by hazardous waste sites, which is in alignment with the commenter's statement about Congress expecting "a regime of federalism to govern environmental stewardship".* *Regarding the commenter's statement about "expansion of the NPL," EPA notes that this rule is not "an expansion of the NPL," rather, as noted above, this rule simply adds an additional scoring mechanism to the existing HRS allowing EPA to evaluate those sites with a high risk to populations for further investigation. Furthermore, the addition of the SsI component to the HRS is within the scope of EPA's statutory authority and is part of CERCLA's mandate to EPA to revise the HRS to ensure that the HRS assesses the relative degree of risk to populations.* *If the commenter is suggesting that this rulemaking will lead to an expansion of the NPL, the NPL expands and will continue to expand regardless of the SsI component addition as additional priority sites are identified. EPA has and will continue to add sites to the NPL each year through a rulemaking regardless of the addition of an SsI component to the HRS. Congress directed EPA by statute to revise the NPL at least annually.*
The NPL is meant to address the sites that are the highest priorities for long-term remedial action, and the HRS reflects this by weighing the "population factor" that might be affected by a potential NPL site. While vapor intrusion might sometimes affect large areas or multiple buildings, it is more often the case that vapor intrusion sites consist of a few buildings, whether they are residences or commercial buildings, with a very limited population of residents or workers. Sites in the former category will likely be captured under the existing HRS, whereas sites in the latter category are best dealt with under other, local corrective action programs.	*EPA disagrees that vapor intrusion sites consist of a few buildings with very limited residential or worker populations and also disagrees that sites with large area or multiple building would likely be captured under the 1990 HRS. The commenter provided no rationale for these assertions. Furthermore, if only a few sites are captured by this rule, not only is it important to address all sites posing a significant risk, these are exactly the type of sites for which the Superfund program is designed to address.* *EPA typically only considers placement of sites on the NPL when other channels have been exhausted. Since EPA adopted the HRS, 52, 859 sites have been assessed under EPA's Superfund program. Of those sites, approximately 10% were considered "NPL-caliber", but were referred to a non-NPL clean-up program (e.g., RCRA, state/tribal). A total of 1,782 were placed on the NPL as of September 2016.*

Comment	Response
	If risks at SsI sites will be effectively addressed under other programs a level equivalent to that would be achieved under Superfund authority, EPA will defer the site to that program. If the program proves to be inadequate, EPA will reconsider its decision.
Consider, by way of analogy, EPA's highly selective use of Superfund program funds to address abandoned methamphetamine laboratories. These facilities are often relatively small; they affect buildings (as well as land); they release hazardous substances; and they often present both indoor air issues and the potential for explosion. Yet EPA responds to only a very small percentage of such sites, and only when local or state resources cannot address the problem. Most contamination resulting from methamphetamine laboratories is dealt with on a local level, and EPA has provided guidance for local entities to address such sites.	*EPA agrees with the point of the commenter's example, which further supports promulgation of this rule. The commenter stated previously that "the NPL is meant to address the sites that are priorities for long-term remedial action…" The addition of the SsI component to the HRS does not change that. Sites, such as many, often small, methamphetamine laboratories, that can be dealt with appropriately under other programs will continue to be handled by other programs. The commenter also noted previously, "…vapor intrusion might sometimes affect large areas or multiple buildings…" These are exactly the types of sites that may be appropriate for an HRS evaluation, those where the risk could affect large populations and other programs may not have the jurisdiction, authority, resources or capabilities to address them effectively and would not be likely to be captured under the 1990 HRS.*
Moreover, as EPA itself demonstrated, this [sites with SsI threats] is an area where the States have become increasingly active. As EPA acknowledges, a 2004 state survey indicated that a majority of responding states indicated that they had only informal processes for addressing VI. Yet, by 2009, another study indicated that 9 states had vapor intrusion specific regulations, 3 more had them under development and 34 states had guidance in place or were developing it. Clearly, some 7 years later, State attention to this issue has only further increased - it appears that as many as 48 states now have some type of vapor intrusion guidance. Indeed, in issuing the June 2015 OSWER vapor intrusion guidance, EPA acknowledged this widespread state activity by recommending that "state agencies ... consider this Technical Guidance when implementing their state-specific guidance for vapor intrusion assessment."	*EPA agrees that in many cases there are alternative ways to address some SsI sites, however not all SsI sites can be addressed under non-Superfund authorities and programs. EPA typically only considers placement of sites on the NPL when other channels have been exhausted. EPA, in dialogue with other federal agencies, states, and tribes, determines the most appropriate mechanism to address the threat posed by hazardous waste sites. EPA often defers sites to other EPA, state, tribal, or federal cleanup authorities, based on whether it is likely that the threat posed by the site will likely be adequately addressed. While some states/tribes have programs to address subsurface intrusion contamination, and the number of these states has increased over time as the commenter notes, they often have limited jurisdiction, authority and resources, and variable remediation criteria. The availability of the federal remedial authority to comprehensively address subsurface intrusion complements and strengthens these programs.*
In sum, most vapor intrusion sites are being, and should be, dealt with by state and local governments, not by EPA. "Uniformity" and having a "comprehensive" federal program are not, in of themselves, goals to be achieved when that is the case. To the extent that such sites warrant federal attention, the Superfund NPL program will rarely be appropriate, because it simply does not provide the rapid response that is needed. There are exceptions, and those sites are apt to be listed due to other concerns, such as ground water contamination. Because few vapor intrusion sites belong on the NPL, opening up the HRS for this purpose is unwarranted.	*EPA agrees that in many cases there are alternative ways to address some SsI sites, however not all SsI sites can be addressed under non-Superfund authorities and programs. EPA typically only considers placement of sites on the NPL when other channels have been exhausted. EPA, in dialogue with other federal agencies, states, and tribes, determines the most appropriate mechanism address the threat posed by hazardous waste sites. EPA often defers sites to other EPA, state, tribal, or federal cleanup authorities, based on whether it is likely that the threat posed by the site will likely be adequately addressed. While some states/tribes have programs to address subsurface intrusion contamination, some do not, or those that do often have limited authority and resources, and variable remediation criteria. Many of the sites that are listed on the NPL are sites that are referred to EPA from State programs that were not able to adequately address the sites under their own authority. The availability of the federal remedial authority to comprehensively address subsurface intrusion complements and strengthens these programs.* *EPA's Superfund removal program has the ability to quickly respond to immediate threats to public health and the environment from the release and a removal action can be implemented regardless of NPL status to eliminate or reduce the threat of a release. However, removal actions, such as installation of vapor intrusion mitigation systems, are not intended to address the source of the contamination. EPA has statutory limitations on the amount of funding and time for conducting removal actions. These limitations may restrict EPA's ability to rely on removal authority alone to fully address subsurface intrusion issues. Congress included in CERCLA Section 104 the Superfund remedial program, which can address releases which cannot be adequately responded to by the Superfund removal program.* *The majority of sites evaluated through the EPA's site assessment program do not meet the criteria for possible placement on the NPL and are "screened out" of the Superfund Remedial process. Since EPA adopted the HRS, 52, 859 sites have been assessed under EPA's Superfund program. Of those sites, approximately 10% were considered "NPL-caliber", but were referred to a non-NPL clean-up program (e.g., RCRA, state/tribal). A total of 1,782 sites were placed on the NPL as of September 2016.*

Comment	Response
III. Superfund Cannot Readily Accommodate a Large Number of New Sites The Proposed Rule speculates that as many as 1,073 different sites are "suspected of having vapor intrusion issues" of a type that "may or may not" qualify for being added to the NPL. As noted above, such limited analysis of such speculative claims hardly justifies a significant revision to the listing process. Moreover, in the unlikely event that those sites have vapor intrusion, how will EPA manage the additional workload? Currently, many high-priority and high-cost NPL sites await remedy selection and construction completion. Many of these projects are progressing far more slowly than EPA's critics, some of whom commented in support of this Proposed Rule, would like. The Superfund program already has its hands full addressing its current workload, and it does not have surplus financial or manpower capacity for new discretionary projects.	*The overall appropriated Superfund budget as well EPA's cooperative agreement budget for performing site assessments has remained relatively steady (or gone down) since 2010; therefore EPA does not expect additional site assessments will be conducted as a result of this rulemaking. EPA does not expect that this proposed change will result in additional site assessments being conducted per year or placement of more sites on the NPL per year. The pipeline of sites will be reviewed to identify those sites that pose the highest risk and prioritized accordingly. This is not a change to how EPA currently evaluates and prioritizes sites for the NPL; EPA will simply have an additional mechanism to address sites that pose the greatest risk. Because assessing the worst sites first is a priority, EPA will continue to identify the sites posing the highest risk or potential risk and develop a strategy to assess those sites in a timely manner, while balancing their other site assessment needs. To the extent that SSP is commenting on the limitations of Superfund budgets to address sites; that is outside the scope of this rulemaking. That adequate budgets do or do not exist does not impact EPA's mandate to protect human health and the environment.*
The Superfund appropriation has remained essentially flat and, based on current budgetary constraints, will likely remain flat for the foreseeable future. Under the circumstances, it would be self-defeating for Superfund to take on a new, ill-defined universe of vapor intrusion sites. Each new site added to the NPL will effectively impose significant long- term financial obligations on the already-strained Superfund budget, long before any appropriation is in place for the out-years.	*EPA considers it critical in a situation with limited budget and resources to utilize its resources where they can be used to most effectively protect human health and the environment. Promulgation of the SsI component to the HRS will improve EPA's ability to do so. The overall appropriated Superfund budget as well EPA's cooperative agreement budget for performing site assessments has remained relatively steady (or gone down) since 2010; therefore EPA does not expect additional site assessments will be conducted as a result of this rulemaking. EPA does not expect that this proposed change will result in additional site assessments being conducted per year or placement of more sites on the NPL per year. The pipeline of sites will be reviewed to identify those sites that pose the highest risk and prioritized accordingly. This is not a change to how EPA currently evaluates and prioritizes sites for the NPL; EPA will simply have an additional mechanism to address sites that pose the greatest risk. Because assessing the worst sites first is a priority, EPA will continue to identify the sites posing the highest risk or potential risk and develop a strategy to assess those sites in a timely manner, while balancing their other site assessment needs. To the extent that SSP is commenting on the limitations of Superfund budgets to address sites; that is outside the scope of this rulemaking. That adequate budgets do or do not exist does not impact EPA's mandate to protect human health and the environment.*
Every new site added to the NPL inevitably diverts resources from other sites, and thereby delays the completion of other high-priority projects. EPA has made it clear that Superfund should not be the "go-to program" for all contaminated sites, because the NPL is "the tool of last resort." See, e.g., U.S. General Accounting Office, GAO/RCED-97-20, Superfund: Times to Complete the Assessment and Cleanup of Hazardous Waste Sites 41 (March 1997) (EPA's Detailed Comments on the Draft Report). Flooding the NPL with new vapor intrusion sites that can be, and are being, dealt with through other approaches would be a poor use of Superfund's limited resources and would compromise the program's overall performance.	*The pipeline of sites will be reviewed to identify those sites that pose the highest risk and prioritized accordingly. This is not a change to how EPA currently evaluates and prioritizes sites for the NPL; EPA will simply have an additional mechanism to address sites that pose the greatest risk. Because assessing the worst sites first is a priority, EPA will continue to identify the sites posing the highest risk or potential risk and develop a strategy to assess those sites in a timely manner, while balancing their other site assessment needs.* *EPA typically only considers placement of sites on the NPL when other channels have been exhausted. The majority of sites evaluated through the EPA's site assessment program do not meet the criteria for possible placement on the NPL and are "screened out" of the Superfund Remedial process. EPA, in dialogue with other federal agencies, states and tribes, determines the most appropriate mechanism address the threat posed by hazardous waste sites. EPA often defers sites to other EPA, state, tribal, or federal cleanup authorities, based on whether it is likely that the threat posed by the site will likely be adequately addressed. While some states/tribes have programs to address subsurface intrusion contamination, they often have limited authority and resources, and variable remediation criteria. The availability of the federal remedial authority to comprehensively address subsurface intrusion complements and strengthens these programs.*
IV. The Proposed Rule Would Prioritize Non-Drinking Water Sites At a July 14, 2015 meeting with EPA and OMB officials to discuss the possibility of a Proposed Rule, SSP learned that a primary objective of this rulemaking is actually not to address vapor intrusion per se. Rather, the goal is to address ground water contamination at sites that currently score too low for listing because no current or future drinking water supplies are affected. In other words, the goal is to expand the focus of Superfund to address sites where the ground water is not being used, and is not expected to be used, for drinking water purposes. No justification has been provided for why such non-drinking groundwater should be an area of high priority, as is implicit in a site becoming an NPL listing.	*EPA disagrees with the commenter's statement regarding the purpose of this rulemaking and considers that the commenter may have misinterpreted the referenced discussion or missed the response to such a claim. Regardless, EPA does not have the funds or mandate under CERCLA to address sites that do not pose a significant threat to human health and the environment. EPA would not pursue an HRS evaluation based on contaminated ground water if there are no populations affected (whether through drinking water wells or vapor intrusion into occupied structures). One of the primary drivers of an HRS evaluation score is the number of people affected by the contamination. Without an adequate number of receptors, the HRS site score will not achieve the 28.50 HRS score necessary for a site to qualify for the NPL.* *Regarding the justification for considering SsI threats (direct contact with indoor air contamination due to subsurface intrusion) equivalent to threats resulting from drinking of contaminated ground water, to the extent feasible based on a screening site assessment,*

Comment	Response
	EPA has established the HRS and the SsI addition so that similar risk levels in all HRS pathways and components will qualify a site for the NPL.
As EPA has noted "SARA requires that EPA give high priority to sites that have led to closing of drinking water wells or contamination of principal drinking water supplies. "Hazard Ranking System, Final Rule, 55 Fed. Reg. 51532, 51547. However, the Proposed Rule states, for the first time, that "The HRS presently does not consider the threat posed at sites by subsurface intrusion problems and direct human exposure, when ground water is not being used as a drinking water source or surficial soils are not contaminated. If promulgated, this proposed rule will for the first time allow the EPA site assessment program to address sites with only subsurface intrusion issues and no coincidental exposure." 81 Fed. Reg. 1 03 7 5. Raising non-drinking water sources to the priority level of drinking water sources would be a big change from the current HRS, which prioritizes ground water that is a potential source of drinking water. (75) If EPA believes there is a case to be made for changing the priority status, then it should make that case in a transparent manner. EPA has not done that.	*The revision to the HRS to add a subsurface intrusion component is not in conflict with the CERCLA 105 mandate to prioritize drinking water sites. The priority given by EPA under CERCLA to sites with a high risk of populations exposed to hazardous substances in drinking water has not decreased with the addition of a subsurface intrusion component to the HRS. In fact, the score for some sites with contaminated drinking water supplies may increase because sites with contaminated drinking water may also be associated with subsurface intrusion contamination, and the combination of the ground water migration pathway score and the SsI component score may increase the overall site score. Furthermore, EPA notes that drinking water is a priority identified by CERCLA, but it is not the only priority identified in CERCLA 105, which also mandates the prioritization of dangers of direct human contact, for which SsI is one example.* *The addition of the SsI component does not change the priority given to drinking water sites. It does not change the scoring of contaminated drinking water supplies under the HRS, reduce in any way the overall HRS score for any site based on drinking water contamination (or any other threat due to exposure to released hazardous substances in the HRS), or change the site score of 28.50 being the HRS score that qualifies sites for placement on the NPL. If a site qualifies for placement on the NPL based on its HRS score reflecting drinking water contamination prior to the addition of the SsI component, it will continue to do so. Adding an evaluation of the SsI component can only increase an overall site score. The algorithm used to combine pathways scores to obtain an overall site score results in an increase in the overall site score with the evaluation of additional pathways, components, and threats scored. In fact, the SsI addition may raise the overall site score at some sites with ground water drinking water contamination from below the 28.50 cut-off score to above it. This may occur because, as stated above, a site's HRS score can increase with the scoring of additional threats. Sites with ground water contaminated by volatile substances and used for drinking water are also sites at which the ground water contamination may volatilize and intrude into overlying regularly occupied structures. Thus, a site at which ground water contamination has occurred but does not have an HRS score above 28.50 based only on the ground water threat, may have an overall HRS site score above 28.50 based on the combination of the scores for the contaminated drinking water and SsI threats.* *In addition it is not "for the first time" that sites can be placed on the NPL without the presence of a drinking water threat; Sites could have an HRS score of 28.50 or greater prior to this rulemaking based on the threat posed to human and environmental receptors via air and surface water releases and due to direct contact with contaminated surfaces such as contaminated soil.* *Furthermore, EPA notes that CERCLA 118 refers to CERCLA sections104 and 108, which address activities that occur pre- or post- NPL-listing, and not to the section of CERCLA that addresses site ranking using the HRS, which is addressed in CERCLA section 105. CERCLA Section 105 and specifically 105(a)(8)(A) requires EPA to prioritize sites based on "the population at risk, the hazard potential of hazardous substances at such facilities, the potential for contamination of drinking water supplies, the potential for direct human contact [and] the potential for destruction of sensitive ecosystems." Since subsurface intrusion contamination is a direct human contact threat, the addition of a subsurface intrusion component, which addresses this threat, is mandated by CERCLA.*
As noted above, the Superfund program already struggles to make adequate progress toward its top-priority objective, i.e., selecting remedies and completing cleanups at the hundreds of as-yet-unfinished NPL sites. EPA is criticized each year for not having achieved enough "construction completion" milestones. Adding lower-priority sites to the NPL would make things worse, not better. Every new site added to the NPL diverts resources from other sites, and delays the completion of other, higher-priority sites.	*The pipeline of sites will be reviewed to identify those sites that pose a priority This is not a change to how EPA currently evaluates and prioritizes sites for the NPL; EPA will simply have an additional mechanism to address sites that pose a priority risk. Because assessing the worst sites first is a priority, EPA will continue to identify the sites posing priority risk or potential risk and develop a strategy to assess those sites in a timely manner, while balancing other site assessment needs.* *Furthermore, actual funding may not necessarily be undertaken in the precise order of HRS scores, however, and upon more detailed investigation may not be necessary at all in some cases. The EPA will determine the need for using Superfund monies for remedial activities on a site-by-site basis, taking into account factors such as state priorities, further site investigation, other response alternatives, and other factors as appropriate.*
V. EPA's Reassurances Are Misplaced In addition to the EPA's affirmative statements as to why the Proposed Rule is necessary, the EPA has offered an additional	*The addition of the SsI component to the HRS will not result in substantial numbers of new listings due to an implicit, unjustified bias towards inferring contamination in general or within all structures in an ASC. The rule does not infer all structures have contamination*

Comment	Response
set of assurances as to what the Propose Rule will not do; assurances that cannot be reconciled with EPA's own description. These provide further reason not to move forward. First, and contrary to the assurances that the Proposed Rule will not result in substantial numbers of new listings, the Proposed Rule appears to have an implicit, unjustified bias toward inferring that contamination is present. In particular, the preamble to the Proposed Rule suggests that occupants of structures within an area of subsurface contamination (ASC) can be included as potential exposure targets, even where existing data indicates that there are no documented exposures.	*in an ASC. By inferring contamination in an ASC, the HRS SsI addition score reflects the possible threat posed by subsurface intrusion at one site relative to other sites. By inferring contamination in an AOE or an ASC between sampling locations, it is not assumed that all populations within the two areas are exposed due to SsI. This interpretation presumes the HRS is a site specific risk assessment and is ranking sites using estimates of site-specific risk. Instead, inferring contamination allows sites with large populations within the two areas to be relatively ranked higher than sites with smaller populations. If the HRS scoring required sampling every structure a sufficient number of times to assure that all exposed targets and their level of exposure were accounted for, the scope of the sampling effort would be beyond that of a screening tool and more consistent with the scope of a remedial investigation.* *Inference of contamination between sampling locations is also assumed in other HRS pathways. The other pathways allow the inference of contamination based on the location of samples documenting the presence of contamination attributable to the site being investigated. For example, in the soil exposure component, inference of contamination is done by drawing AOC boundaries based on sample locations and inferring that those targets associated with the properties within the boundaries are actually exposed. Similar inference is done in the surface water and air migration pathways.* *In the SsI component, unless site-specific information indicates otherwise, when delineating an AOE or an ASC, populations in occupied structures within an AOE are inferred to be actually exposed, and, populations in occupied structures within an ASC are inferred to likely be exposed to contamination.*
Moreover, this [that occupants of structures within an area of subsurface contamination (ASC) can be included as potential exposure targets] appears directly contrary to Section 5.2.1.1.2.1, which states that populations in structures that show no possible SsI route will not be evaluated under the new SsI component. Similarly, for the HRS worksheets, using hypothetical formulas and county household estimates to estimate "population" related to "regularly occupied structures" may produce similar bias.	*Furthermore, the commenter may be misinterpreting language in the preamble pertaining to the structure containment factor. Populations in structures within an ASC where no indoor air exposure has demonstrated observed exposure has occurred are not inherently restricted from scoring. The preamble to the rule at promulgation does not contain this statement. Nor does the preamble to the final rulemaking notice.* *If the commenter is referring to part of the description of the containment factor in the preamble to the proposed HRS SsI Addition: preamble section VI.3.b.i, Structure Containment, which discusses HRS Section 5.2.1.1.2.1, Structure containment, the language of the proposed HRS itself, Section 5.2.1.1.2.1, Structure containment, provides specific examples of structure features resulting in various structure containment factor values, including those for which a factor value of zero (contained from subsurface intrusion) would be assigned.* *The preamble language at proposal refers to general restrictions on the scoring of target populations associated with structures that are fully contained from intrusion and would receive a containment factor value of zero. This concept was included in the HRS SsI Addition at proposal in sections such as 5.2.0, General considerations, and 5.2.1.1.2, Potential for exposure, and has been clarified by related language added at promulgation in sections 5.2.1.3, Targets, 5.2.1.3.2.1, Level I concentrations, and 5.2.1.3.2.2, Level II concentrations.* *The commenter may have misinterpreted this language in the preamble to the proposed HRS SsI Addition to equate the absence of an observed exposure as "no possible SsI intrusion route." The lack of a documented observed exposure based on indoor air samples collected during the SI (typically a short timeframe of 1-2 days) within a structure located above an ASC does not indicate that there is no possible SsI route into the structure (or that the containment factor value is zero). It only indicates there was no observed vapor intrusion identified during the sampling time period. However, a structure located above an ASC may have experienced vapor intrusion at other times aside from when the indoor air sampling was conducted, or could experience vapor intrusion in the future, based on the temporal and spatial variability of vapor intrusion. Therefore, the target populations associated with structures in an ASC are not inherently restricted from scoring by the lack of an observed exposure.* *It is unclear which formulas the commenter is referencing, formulas for hazardous waste quantity and on using county averages to estimate populations actually or probably exposed. Given an HRS score is based on information that can be collected during a limed duration screening assessment, the resulting estimates are likely to be as precise as the HRS score can reasonably be. Because the HRS includes large ranges for estimating waste quantity, not precise values, a considerable amount of imprecision is acceptable without having a major impact on the score. The HRS prioritizes sites using a relative risk ranking between sites, not on a site-specific risk ranking; therefore this level of precision is acceptable. To be more accurate, it would require a significantly greater about of information gathering, which may or may not be available, especially at abandoned sites. Furthermore, for a site being proposed to the NPL, during*

Comment	Response
	which the public has 60 days to submit comments, if the commenter supplies more information on the specific number of people in an occupied structure, or the total amount of hazardous substances released, for example, they can submit that information and, if necessary, EPA will adjust the score accordingly.
Second, the Proposed Rule has the potential to greatly increase the level of effort required to score a site, contrary to EPA's assurance that the new SsI component will not result in substantial additional costs and will not significantly complicate site evaluations. In fact, that appears to be a very direct and real risk, given that the EPA appears also to be suggesting that the scoring methodology turns heavily on identifying Areas of Observed Exposure (AOE), in addition to the ASC areas mentioned above. Determining whether an area is an AOE is likely to include indoor air sampling and background air sampling, while setting the boundaries of an ASC is likely to include both groundwater and soil vapor sampling. Each of these will likely involve effort beyond what is currently required for a typical preliminary assessment. Moreover, conducting indoor air sampling in a manner that avoids false positives from other indoor sources or significant outdoor sources, identifying an appropriate number of samples and similar questions all will themselves require effort that is beyond the normal for this stage of the listing process. Finally, EPA must be mindful that even if the HRS addendum only scores significantly those structures that are currently regularly occupied, later assessments as to a listed site might require evaluation of future hypothetical exposures that could occur, dramatically increasing data collection burdens and costs.	*EPA acknowledges that in some cases the scope of a typical site inspection (SI) may need to be expanded to collect the information necessary to evaluate the SsI threat present at a site. EPA also acknowledges that sites that did not qualify previously for the NPL, may now do so. The number of samples and level of effort required to evaluate a site using the 1990 HRS pathways or components already varies on a site-by-site basis depending on the size and extent of contamination at the site. An expanded site inspection (ESI) may be performed for any site for any pathway or component to fill data gaps from the SI. Therefore, it cannot be predicted with certainty that there will be an overall increase in cost or level of effort for any particular site due to the HRS SsI Addition. However, the overall budget for performing site assessments per year is not expected to change significantly. EPA's budget for site assessment is dependent on Congressional appropriation and EPA does not expect the rulemaking to impact the appropriation. EPA's budget for site assessment has remained relatively constant for the last several years. Hence, EPA expects that the allocation of available resources may be changed to reflect this rulemaking but will continue to be optimized by EPA, its state and tribal partners, and with other federal agencies to evaluate priority sites. However, the number of site assessments or NPL proposals conducted each year will not significantly increase.* *EPA notes that the agency's remedial and removal programs, as well as States and tribes, have been evaluating subsurface intrusion threats for many years at somewhat increased expenses, but well justified considering the risks associated with indoor air contamination. Gathering the additional information necessary to evaluate these sites using the SsI component is not expected to be a significant cost expenditure over and above the typical site inspection and/or expanded site inspection.*
Third, it is impossible to square EPA's justification of this Proposed Rule through EPA's reference to 1,073 potential sites with EPA's competing claims that this action will not have significant resource implications. Certainly EPA will have to devote some resources to assessing those 1,073 sites, if simply just to prioritize within them as to what sites will then get more attention for potential scoring. But that sorting alone, especially given the number of sites identified and the apparent paucity of existing information for hundreds of them, signals a major resource investment by the Superfund program to develop sufficient information and then conduct the review required. This necessarily must come at the expense of better priorities. In sum, the resource implications of the Proposed Rule appear to be much greater than EPA has acknowledged. When those are taken properly into account, the Proposed Rule founders even further in its rationale.	*As noted previously, the number of sites that are proposed to the NPL is a very small percentage of those that are assessed as part of EPA's site assessment program. Furthermore, the 1,073 sites are not intended to be evaluated by EPA as a result of this rule.* *Regarding prioritizing sites, the existing agency policy for prioritizing sites by relative risk will continue. The pipeline of sites will be reviewed to identify those sites that pose the highest risk and prioritized accordingly. This is not a change to how EPA currently evaluates and prioritizes sites for the NPL; EPA will simply have an additional mechanism to address sites that pose the greatest risk. Because assessing the worst sites first is a priority, EPA will continue to identify the sites posing the highest risk or potential risk and develop a strategy to assess those sites in a timely manner, while balancing other site assessment needs.*
VI. Conclusion The Proposed Rule does not constitute sound public policy. Adding vapor intrusion sites to the NPL would be an arduous undertaking that would consume millions of dollars, require multiple FTEs, and add to the cost and expense of future HRS-assessments, but likely yield few or no benefits. The Superfund NPL process, with its lengthy studies, protracted investigations, and adversarial process, is not at all well-suited to address most vapor intrusion sites. Most vapor intrusion sites are appropriately dealt with, and more expeditiously, by state and local government corrective action programs than by Superfund. Because EPA has failed to demonstrate that there is a problem, and that listing vapor intrusion sites on the NPL will solve that problem, EPA should not finalize the Proposed Rule.	*Promulgation of this rule is not contingent on identifying sites that can only be placed on the NPL due to the inclusion of a subsurface intrusion component to the HRS; rather EPA is complying with the CERCLA 105 (a)(8)(A) mandate. Not having the ability to evaluate the known risk due to subsurface intrusion to human health is contrary to the CERCLA 105 mandate. Whether or not sites are identified for placement on the NPL is not relevant in terms of justification to revise the HRS.* *The addition of a subsurface intrusion component to the HRS constitutes sound public policy. EPA considers the addition of an SsI component to the HRS necessary for the agency, and organizations performing work on behalf of EPA (state and tribal partners), to be able to address SsI (including VI) threats at sites with a priority for further investigation using its authority under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). EPA has modified the HRS to comply with the statutory requirements in the 1986 Superfund Amendments and Reauthorization Act (SARA), which added section 105(c)(1) to CERCLA requiring EPA to amend the HRS "to assure to the maximum extent feasible, that the HRS accurately assess the relative degree of risk to human health and the environment posed by sites and facilities subject to review."* *Contamination due to subsurface intrusion is a known risk to human health and the ability to evaluate those risks is consistent with the CERCLA 105 mandate. The 1990 HRS did not evaluate the risk posed by subsurface intrusion when evaluating sites for the NPL, as the state of the science would not have supported it at that time. As part of the development of this rule, EPA identified priority sites with significant contamination due to SsI that could not be evaluated using the 1990 HRS for possible placement on the NPL. With the addition of the SsI component to the HRS, sites can now be evaluated more comprehensively to consider the relative risk posed by a site.*

Comment	Response
	Regarding the commenter's assertion that adding sites with SsI sites to the NPL would be an arduous undertaking and consume many resources at the expense of future HRS assessments and yield no benefits, the addition of a subsurface intrusion component to the HRS does not change any of the processes currently in place for evaluating candidate sites for the NPL to potentially promulgate. Given that the Superfund budget is likely to remain relatively stable or be reduced, the EPA site assessment program will continue to prioritize those sites that pose a high risk to human health and the environment. Regarding the commenter's statement that the NPL is not well suited to address most vapor intrusion sites, and more appropriately dealt with by state and local programs, the NPL was established by CERCLA and implemented under the NCP for those sites that cannot be addressed through other programs. EPA will, in coordination with other federal agencies, states and tribes determine the most appropriate mechanism address the threat posed by hazardous waste sites. This is the same process used for any site, regardless of pathway, and will not change with this rulemaking. *EPA disagrees that the agency has failed to demonstrate there is a problem and should not finalize the rule, EPA presented, with the assistance of the EPA Regional staff responsible for evaluating candidate sites for an HRS evaluation, 11 priority sites, termed test sites, with significant contamination due to SsI in addition to threats from other HRS pathways. Several of these sites were already evaluated under one or more of the other HRS pathways of the 1990 HRS and did not qualify for the NPL. With the addition of the SsI component to the HRS, sites can now be evaluated more comprehensively to consider the overall threat posed by the release(s) being evaluated. Further, at least one site is currently being evaluated using the SsI component and the documentation is being prepared to support proposal of this site to the NPL as soon as this rule is promulgated; and additional sites are being considered for evaluation using the SsI component by states and their EPA regional partners.*

Submitter: 0100 - Stephen P. Risotto, American Chemistry Council's (ACC) Chemical Products and Technology Division

Public Submission Posted: 05/02/2016

ID: EPA-HQ-SFUND-2010-1086-0100

Comment	Response
ACC/CPTD opposes the proposal to add an SsI component to the HRS. EPA has not established a sufficient rationale to support the contention that the proposed change would result in the addition of sites to the NPL that would not otherwise be listed. In addition, EPA has not provided evidence to support its contention that any potential risks to human health at these sites cannot be, and have not been, adequately addressed through existing federal and state programs. On the contrary, the proposal acknowledges that federal removal and enforcement actions can be conducted at any site, regardless of NPL status, and that existing mitigation systems to address vapor intrusion are effective at promptly reducing potential threats to human health.	*EPA acknowledges the American Chemistry Council (ACC) Chemical Products and Technology Division's (CPTD) opposition to the addition of a subsurface intrusion component to the HRS.* *The rationale for revising the HRS to add a subsurface intrusion component is to comply with Congress's direction as stated in CERCLA as modified by SARA. Specifically, CERCLA 105 (a)(8)(A), requires EPA to amend the HRS "to assure to the maximum extent feasible, that the HRS accurately assess the relative degree of risk to human health and the environment posed by sites and facilities subject to review." Contamination due to subsurface intrusion is a known risk to human health and the ability to evaluate those risks is consistent with the CERCLA 105 mandate.* *Furthermore, promulgation of this rule is not contingent on identifying sites that can only be placed on the NPL due to the inclusion of a subsurface intrusion component to the HRS. The number of identified sites with subsurface intrusion contamination is not critical in terms of justification to revise the HRS.* *However, identification of the 11 sites (Test Sites) (provided in the Technical Support Document (TSD) for this rulemaking that were used to test the SsI component) in the context of the NPL universe, is a significant number of sites that have sufficient documented risks to human health due to subsurface intrusion to warrant an HRS evaluation. To provide perspective, historically, only a small percentage of sites (about 3%) evaluated through EPA's site assessment process are selected for placement on the NPL. Further, at least one site is currently having documentation prepared to support its proposal to the NPL as soon as this rule is promulgated.* *Regarding the commenter's statement that EPA has failed to provide "evidence to support its contention that any potential risks to human health at these sites cannot be, and have not been, adequately addressed through existing federal and state programs." EPA agrees that in many cases there are alternative ways to address some SsI sites, however not all SsI sites can be addressed under non-Superfund authorities and programs. EPA typically only considers placement of sites on the NPL when other channels have been exhausted. EPA, in dialogue with other federal agencies, states and tribes, determines the most appropriate mechanism to address the threat posed by hazardous waste sites. EPA often defers sites to other EPA, state, tribal, or federal cleanup authorities, based on whether it is likely that the threat posed by the site will likely be adequately addressed. While some states/tribes have programs to address subsurface intrusion contamination, they often have limited authority and resources, and variable remediation criteria. The availability of the federal remedial authority and the more comprehensive site assessment program complements and strengthens these programs.* *Other EPA programs such as the Resource Conservation and Recovery Act (RCRA) and the Brownfields program have limited authority and ability to address all subsurface intrusion threats. The RCRA Corrective Action/Enforcement program is only applicable at sites currently subject to RCRA permitting or sites otherwise reachable by RCRA's enforcement activities. Furthermore, RCRA is a delegated program in many states and not all states recognize subsurface intrusion as a significant issue. RCRA sites with subsurface intrusion issues may not be addressable in all states. Also, governmental entities with site-specific Brownfields assessment and/or revolving loan fund cleanup may only use grant funds on the selected eligible property. While SsI sites may be eligible for Brownfields cleanup grants, site or property-specific limitations may not allow for permanent remediation.* *Regarding the commenter's statement about effective use of mitigation systems. EPA has statutory limitations on the amount of funding for conducting removal actions, of which mitigation systems are commonly utilized. These limitations may restrict EPA's ability to rely on removal authority alone to fully address subsurface intrusion issues. Congress included in CERCLA Section 104 the Superfund remedial program, which can address releases which cannot be adequately responded to by the Superfund removal program. Superfund removal and enforcement actions may not provide a comprehensive approach to addressing risks from subsurface intrusion at all sites.* *Furthermore, the commenter is correct that removal actions can be implemented regardless of NPL status to eliminate or reduce the threat of a release, such as installation of vapor intrusion mitigation systems. However, they are not intended to address the source of the contamination.*
I. Background	
The current proposal suggests a greatly expanded list of 1,080 potential sites (1,073 - VI, 7 - groundwater	*Regarding the commenter's statement that due to the little detail provided on the 1,073 sites, only meaningful comments could be provided on the Tier 1*

Comment	Response
intrusion), but provides no information on the vast majority of the sites and scant details on the process EPA used to identify them. It is only possible, therefore, to comment meaningfully on the 11 VI sites with "documented actual exposure" in Tier 1 of Appendix D of the Technical Support Document. Among the 11 sites described in Appendix D, EPA indicates that VI mitigation has been undertaken at five of the sites. The one groundwater contamination example provided in Appendix F of the Technical Support Document is already included on the NPL and would not be impacted by the current proposal.	*sites. It should be noted that EPA requested input on the proposed SsI component, not the sites used for testing, nor the site inventory. Furthermore, it is not necessary to know the details of the sites in the site inventory for commenting on the SsI component to the HRS.* *Regarding statements about the status of the Tier 1 sites. The purpose of the Tier 1 sites is noted below in this response. Furthermore, EPA notes that just because five of the sites have implemented mitigation systems does not necessarily imply that the source of the contamination has been addressed, which is the goal.* *The purpose for collecting sites that make up the site inventory was to identify sites to test the SsI component, not in itself to justify the addition of the SsI component to the HRS. The inventory was provided in the technical support document (TSD) for the proposed rule to show the possible magnitude of the problem. Details on each site were not provided because 1) that information is not necessary to evaluate the SsI component and 2) while the EPA regions identified the sites as having possible contamination due to SsI, providing details about those sites based on preliminary or incomplete data would be pre-decisional. The preamble to the final rule was revised to clarify the process for identifying the 1,073 sites the wording for which is included in the Preamble to the Final Rule, section III.C.2* *The commenter is correct that the one site referred to by the commenter in Appendix F of the TSD (the Garfield Ground Water Contamination Site) is not impacted by this rule. However, as noted in a previous response, promulgation of this rule is not contingent on identifying sites that can only be placed on the NPL due to the inclusion of a subsurface intrusion component to the HRS. Furthermore, the site could not be evaluated under the 1990 HRS due to the lack of a mechanism to evaluate human exposure resulting from intrusion of contaminated ground water (subsurface intrusion contamination). The only viable option to place the site on the NPL was to rely on the Agency for Toxic Substances and Disease Registry (ATSDR) to make a determination that the exposure at the site posed a significant threat to public health. The decision to include sites on the NPL based on a determination by the ATSDR is made infrequently because the mechanism was designed to be used only when ATSDR designated the threat found to warrant immediate dissociation from the release and other criteria are met. This is not a mechanism that can be used uniformly and consistently. It is highly resource intensive and may not comprehensively address all chronic threats. Therefore, the Garfield Ground Water Contamination site demonstrates the need for the ground water intrusion portion of the SsI component.*
As a final rationale, EPA suggests that there is "substantial public support" for the proposal based on the response it received to the 2011 Notice of Opportunity for Public Input and four subsequent public listening sessions held across the country. Yet the total of 40 written responses is relatively modest given the amount of outreach the Agency conducted. This is particularly true since a significant number of the comments focused on a single site in New Jersey (Pompton Lakes) that has been addressed under the RCRA Corrective Action program and would not be considered for NPL listing. More importantly, the Docket includes comments from only about one-third of the states on the possible expansion of the HRS to include VI. These include individual comments from five states and the results of a survey of 14 states by the Association of State and Territorial Solid Waste Management Officials (ASTSWMO). Considering EPA's suggestion that state remediation programs stand to benefit significantly from the proposal, it is curious that EPA fails to address the lack of a response on its proposal from about two-thirds of these programs. The comments from one of the states (State J) included in the ASTSWMO survey opposing the proposal may help to explain why the response from the states was not more significant – At the present time, predictions on [vapor intrusion] are more art than science. EPA's national policy is unsettled, but the recent (September, 2010) publication of the Region 6 Corrective Action [Vapor Intrusion] Policy indicates a trend to "screen in" all sites where [vapor intrusion] may possibly be an issue, with no reasonable way to "screen out" sites with negligible risks ….once a site is "screened in" the only way to conclude that [vapor intrusion] is not an issue….is to take multiple sub-slab and indoor air samples, which can be very intrusive and disruptive in residences. And, repeated sampling may be needed to address seasonal variability and contaminant plume instability. State J highlights a concern about the inability to "screen out" sites that is perpetuated in the Agency's recently finalized guidance on assessing and mitigating the VI pathway. The comment further notes the implications of the need for repeated sampling for the Superfund ranking process – the inclusion of [vapor intrusion] into the [Hazard Ranking System] will greatly increase the costs, time, and difficulty of ranking sites. It will also be a continuing effort, as the expansion of a contamination	*The lack of written support by one state does not necessarily demonstrate lack of public support for this rulemaking. It has been EPA's experience that if the public does not support a proposed EPA action, it receives copious amounts of written documentation of this lack of support. EPA did not receive overwhelming written negative support as a result of the 2011 Notice of Opportunity for Public Input or the 2016 Proposed HRS Addition.* *The preamble to the final rule was revised to clarify that EPA's statutory authority under CERCLA and the agency's inability to evaluate sites with SsI contamination that cannot be addressed by other authorities are the main reasons for revising the HRS.* *Furthermore, the rationale for amending the HRS to include consideration of the threat posed by subsurface contamination is the Congressional mandate for the HRS to assess to the maximum extent feasible all threats to human health posed at NPL candidate sites and the agency's inability to address the threat posed by SsI contamination under the CERCLA remedial program that cannot be addressed by other authorities. The preamble to the rulemaking adding the SsI component to the HRS has been revised to clarify this justification.* *The rationale for revising the HRS to add a subsurface intrusion component is to comply with Congress's mandate as stated in CERCLA as modified by SARA. Specifically, CERCLA 105 (a)(8)(A), requires EPA to amend the HRS "to assure to the maximum extent feasible, that the HRS accurately assess the relative degree of risk to human health and the environment posed by sites and facilities subject to review." Contamination due to subsurface intrusion is a known risk to human health and the ability to evaluate those risks is consistent with the CERCLA 105 mandate. The decision to revise the HRS to include a subsurface intrusion component was not driven by public support. The preamble to this rulemaking was revised to clarify that EPA's statutory authority under CERCLA and the agency's inability to evaluate sites with SsI contamination that cannot be addressed by other authorities are the main reasons for revising the HRS.* *Regarding State J's comments and other comments from ASTSWMO, this organization submitted comments on this proposed SsI addition and are addressed in another part of this support document*

Comment	Response
plume from an uncontrolled site may continually increase the number of residences or other buildings which must be considered. These concerns are consistent with the responses from several of the industry commenters opposing the expansion of the HRS, to which the EPA proposal makes only a passing reference without addressing the specific issues raised in these comments.	
II. The NPL Remedial Program Is Poorly Suited To Address Subsurface Intrusion Issues The HRS was established in response to the requirement in Section 105(a)(8)(A) of CERCLA to prioritize the most serious threats to public health and the environment based on "the population at risk, the hazard potential of hazardous substances at such facilities, the potential for contamination of drinking water supplies, the potential for direct human contact [and] the potential for destruction of sensitive ecosystems." Once sites are identified, the NPL program conducts long-term remediation to permanently address soil and groundwater contamination. VI and other subsurface intrusion situations, on the other hand, typically would have an impact on a limited number of individuals and do not involve drinking water exposures. Response actions to address public health concerns at VI sites can be implemented quickly and can effectively address both short-term and long-term exposures.	*While EPA has authority under the Superfund emergency removal program to address risks that pose immediate and substantial endangerment to public health without placing the site on the NPL, not all public health risks posed by subsurface intrusion can be addressed without use of the Superfund remedial program. The Superfund remedial program is an integral part of the overall CERCLA program to assure that SsI risks to populations are permanently remediated. For a site to be cleaned-up using Superfund remedial funding, the site must be on the NPL.* *CERCLA establishes both a removal program, designed to address in a timely manner acute risks posed by releases of hazardous substances, and remedial program, designed to address chronic risks and other risks not addressable by CERCLA removal actions. EPA's Superfund removal program has the ability to quickly respond to immediate threats to public health and the environment from the release; a removal action can be implemented regardless of NPL status to eliminate or reduce the threat of a release. However, removal actions, such as installation of vapor intrusion mitigation systems, are not intended to necessary address the source of the contamination. For example, removal actions can be used as stopgap measures to break the exposure chain until a permanent remedy is implemented. In addition, CERCLA has statutory limitations on the amount of funding and time for conducting removal actions. These limitations may restrict EPA's ability to rely on removal authority alone to fully address subsurface intrusion issues. Congress included in CERCLA Section 104 the Superfund remedial program, which can address releases which cannot be adequately responded to by the Superfund removal program.* *Simply because a site may have immediate risks to a population that can be mitigated by removal actions, does not preclude it from being addressed by the remedial program; the two programs can function simultaneously. Further, many sites addressed under the Superfund program use a combination of removal and remedial authority to achieve a balance of mitigation of imminent risk with long term cleanup to address the source of contamination. Therefore, addressing a site with SsI issues using EPA's removal program to respond to immediate threats and the remedial program to permanently address the source of the contamination when no other programs have the authority or funding to address is an appropriate fit for the Superfund program.* *Regarding the commenter's statement about a typical VI exposure scenario and the CERCLA 105 citation, EPA notes that the citation includes "the population at risk" and "the potential for direct human contact", subsurface intrusion, including VI, poses a risk to populations in regularly occupied structures and the exposure in the structures is via direct human contact to the intruded hazardous substances Additionally, the commenter does not provide any rational or backup for or quantitation for the assertion that "subsurface intrusion situations typically impact a limited number of individuals. Moreover, for subsurface intrusion situations that do not impact a large number of populations, those sites would likely not be considered NPL-caliber and would be potentially addressed by other programs. The size of the population affected by contamination is typically a main driver for a site to qualify for the NPL based on an HRS evaluation and is equivalent to the affected population needed to score 28.50 or greater using other HRS pathways.* *Furthermore, removal actions do not necessarily permanently address the source of the contamination and potential future risks, which is the goal of the Superfund remedial program. In addition, removal actions may not address a long-term chronic VI issue. If indoor air concentrations do not rise to the level of an imminent threat , the removal program may not have the authority to address all risk posed by subsurface intrusion, even though a long-term threat may exist.*
A. Most Vapor Intrusion Sites Do Not Meet The Criteria For NPL Listing Among the main reasons that EPA offers in support of its proposal is the suggestion that the additional sites would not otherwise be considered for NPL listing because they do not impact ground (or surface) water that is used as a drinking water source. As a consequence, these sites would not be given a score under the ground water migration pathway which evaluates the likelihood that hazardous substances will migrate to ground water and contaminate aquifers and drinking water wells that draw on those aquifers. Yet CERCLA specifically requires that facilities that have contaminated a principal drinking water supply be given "high priority" for listing on the NPL. It seems unlikely, therefore, that the VI sites would be ranked above other sites under consideration for the	*The commenter is incorrect that CERCLA requires all sites that pose a risk to drinking water supplies be prioritized above all other sites that pose risks to human health and the environment via other exposure routes. CERCLA 105 only identifies that threats to drinking water supplies be one of the factors considered in prioritizing sites for the NPL. CERCLA 105(a)(8)(A) directs EPA to prioritize the most serious threats to public health and the environment based on "the population at risk, the hazard potential of hazardous substances at such facilities, the potential for contamination of drinking water supplies, the potential for direct human contact [and] the potential for destruction of sensitive ecosystems."* *In addition, the priority given by EPA under CERCLA to sites with a high risk of populations exposed to hazardous substances in drinking water has not decreased with the addition of a subsurface intrusion component to the HRS. In fact, the score for some sites with contaminated drinking water supplies may increase because sites with contaminated drinking water may also be associated with subsurface intrusion contamination, and the*

Comment	Response
NPL that threaten drinking water supplies.	*combination of the ground water migration pathway score and the SsI component score may increase the overall site score.* *Furthermore, the addition of the SsI component does not change the priority given to drinking water sites. It does not change the scoring of contaminated drinking water supplies under the HRS, reduce in any way the overall HRS score for any site based on drinking water contamination (or any other threat due to exposure to released hazardous substances in the HRS), or change the site score of 28.50 being the HRS score that qualifies sites for placement on the NPL. If a site qualifies for placement on the NPL based on its HRS score reflecting drinking water contamination prior to the addition of the SsI component, it will continue to do so. Adding an evaluation of the SsI component can only increase an overall site score. The algorithm used to combine pathways scores to obtain an overall site score results in an increase in the overall site score with the evaluation of additional pathways, components, and threats scored. In fact, the SsI addition may raise the overall site score at some sites with ground water drinking water contamination from below the 28.50 cut-off score to above it. This may occur because, as stated above, a site's HRS score can increase with the scoring of additional threats. Sites with ground water contaminated by volatile substances and used for drinking water are also sites at which the ground water contamination may volatilize and intrude into overlying regularly occupied structures. Thus, a site at which groundwater contamination has occurred but does not have an HRS score above 28.50 based only on the groundwater threat, may have an overall HRS site score above 28.50 based on the combination of the scores for the contaminated drinking water and SsI threats.* *Prior to the addition to Section 105(a)(8)(A)was added to CERCLA by SARA in 1985, sites could qualify for the NPL using the then existing HRS with no documented drinking water threat; Sites could have an HRS score of 28.50 or greater based on the threat posed to human and environmental receptors via air and surface water releases. If Congress had objected to ranking sites with no drinking water threat above sites with a drinking water threat, it would have so stated.* *Furthermore, EPA notes that CERCLA 118 refers to CERCLA sections104 and 108, which address activities that occur pre- or post- NPL-listing, and not to the section of CERCLA that addresses site ranking using the HRS, which is addressed in CERCLA section 105. CERCLA Section 105 and specifically 105(a)(8)(A) requires EPA to prioritize sites based on "the population at risk, the hazard potential of hazardous substances at such facilities, the potential for contamination of drinking water supplies, the potential for direct human contact [and] the potential for destruction of sensitive ecosystems." Since subsurface intrusion contamination is a direct human contact threat, the addition of a subsurface intrusion component, which addresses this threat, is mandated by CERCLA.*
Compared to the sites currently addressed under the NPL, moreover, VI sites typically impact individual buildings and consequently are likely to have an impact on a far smaller population. Since the size of the population at risk is among the principal criteria to be considered in developing the NPL, VI sites will score lower than those sites that are impacting a far greater numbers of people. While the proposal suggests that exposure may increase over time due to migration and expansion of a plume of subsurface contamination, EPA has appropriately elected not to include consideration of future migration in the proposed subsurface intrusion component. This decision is based on the Agency conclusion that "[T]he possibility of placing sites on the NPL based on speculative projections with no demonstrated risk of actual exposure is too significant.	*EPA disagrees that VI sites typically impact individual buildings and therefore impact a smaller population. EPA's experience while developing the SsI component is that typical sites being considered for the NPL are composed of multiple structures and for one pilot study site, approximately one hundred structures were included in the site evaluation. The commenter provided no rationale for these assertions. Furthermore, if only a few sites are captured by this rule, not only is it important to address all sites posing a significant risk, these are exactly the type of sites for which the Superfund program is designed to address.* *If the commenter is suggesting that the SsI component is unnecessary due to the commenter's position that VI only impacts smaller populations and that there will be very few SsI sites that score high enough for placement on the NPL, it should be clarified that only small %s of sites that are evaluated by EPA through the site assessment program are evaluated using the HRS and an even smaller % are placed on the NPL.* *However, based on a screening level effort to identify sites with SsI contamination, 11 sites were determined to be of NPL-caliber and would be potential candidates for the NPL. The main point is that there are very few sites overall that are placed on the NPL compared to the number of sites evaluated. But, it is that small number of sites that cannot be addressed by other authorities or programs that make this addition of the SsI component necessary.*
EPA repeatedly stresses that the HRS process should be able to be performed quickly with a minimum of investigation. However, the determination of weight factors for several of the SsI components requires specific information on site geology and hydrogeology, contaminant type, location, and concentration, and soil bioactivity which may or may not be readily available or obtainable in the course of a sampling effort spanning only a few days.	*It is EPA's experience based on evaluation of more than 50,000 sites since EPA adopted the HRS, it is not unreasonable to expect type of information the commenter is referring to, to be available during, or prior to, an SI. Information used for an HRS evaluation need not always be collected during an SI; a lot of information is already available and will help inform decision making. And, for all 11 of the test sites, the type of information the commenter is referring to was available from existing studies not designed to collect information for performing an HRS evaluation. EPA notes that the sampling required to implement the HRS SsI Addition is similar in scope to that required for evaluating sites using other HRS pathways and is within the scope of a screening assessment. The required sampling is not equivalent to that needed to fully characterize the nature and extent of the contamination and risk at the site. However, implementation of the HRS SsI Addition will likely require data to be collected that is not discussed in the present SI Guidance (e.g., indoor air samples), and may require a longer duration than the average sampling event for evaluation of sites under other pathways in the HRS.*

Comment	Response
B. Reduction of Source Contamination Is Not The Most Cost Effective Approach To Reducing The Potential For Vapor Intrusion The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) from which the HRS and NPL are derived is premised on the implementation of response actions that eliminate or substantially reduce the level of contamination on the source medium. Consequently, NPL sites undergo long-term response actions that strain the Agency's resources and are often left incomplete. For this reason EPA has indicated that the NPL should be "a choice of last resort when other cleanup options are not practical or available." The Agency consequently has deferred 1,984 of 3,402 sites (58 percent) reported in the Comprehensive and Environmental Response, Compensation, and Liability Information System (CERCLIS) to cleanup approaches outside of the Superfund program. Yet the proposal diminishes the value of programs like RCRA Corrective Action and Brownfields programs by suggesting that they have limited authority or ability to address VI threats. Among the principal limitations of RCRA and Brownfields, the proposal lists the same issue – inadequate funding – that plagues the Superfund Program.	*The addition of the SsI component to the HRS does not diminish the role of other programs and authorities charged with addressing subsurface intrusion risk. In fact, it complements these programs in that Superfund is historically used only when other programs prove insufficient to address subsurface intrusion risks.* *Regarding the commenter's assertion that placing a site on the NPL is not the most cost effective approach to reducing the potential for vapor intrusion, it is the most cost effective approach when no other program can address the subsurface issues. It may be true in some cases that remedial action is not warranted to address source contamination at SsI sites. However, EPA has statutory limitations on the amount of funding and time for conducting removal actions. These limitations may restrict EPA's ability to rely on removal authority alone to fully address subsurface intrusion issues. Congress included in CERCLA Section 104 the Superfund remedial program, which can address releases which cannot be adequately responded to by the Superfund removal program.* *Regarding the commenter's suggestion that the rule "…diminishes the value of programs like RCRA Corrective Action and Brownfields by suggesting they have limited authority to address VI threats", EPA maintains that other EPA programs such as the Resource Conservation and Recovery Act (RCRA) and the Brownfields program have limited authority and ability to address all subsurface intrusion threats. The RCRA Corrective Action/Enforcement program is only applicable at sites currently subject to RCRA permitting or sites otherwise reachable by RCRA's enforcement activities. Furthermore, RCRA is a delegated program in many states and not all states recognize subsurface intrusion as a significant issue. RCRA sites with subsurface intrusion issues may not be addressable in all states. Also, governmental entities with site-specific Brownfields assessment and/or revolving loan fund cleanup may only use grant funds on the selected eligible property. While SsI sites may be eligible for Brownfields cleanup grants, site or property-specific limitations may not allow for permanent remediation.* *Regarding the commenter's suggestion that as a result of addressing contamination through long term cleanup, sites "…are often left incomplete" and therefore forces the agency to defer sites to other programs, referring such sites post NPL-listing is not an indication that the Superfund program is necessarily unable to fully address the site; rather, it indicates there is an alternate mechanism to address the threat. This enables EPA to allocate resources in the most appropriate manner. EPA defers sites to other programs during all phases of the site assessment process, more often prior to an HRS evaluation. Since EPA adopted the HRS, 52, 859 sites have been assessed under EPA's Superfund program. Of those sites, approximately 10% were considered "NPL-caliber", but were referred to a non-NPL clean-up program (e.g., RCRA, state/tribal). 1,782 were placed on the NPL, as of September 2016. Furthermore, EPA notes CERCLA Section 121 (c) requires EPA to review all remedial actions at NPL sites with contamination left in place every five years to ensure that they remain protective of human health and the environment.*
The proposal also expresses concern about the use of vapor mitigation systems that are commonly used to address VI concerns. While noting that these systems are effective for protecting human health, EPA argues that they may not contribute to the Superfund program's goal of cleaning up uncontrolled hazardous waste. Since public health protection is the stated intent of the prioritization under the NCP, vapor mitigation systems would appear to be as effective, if not more so, as long-term clean-up under the Superfund program.	*EPA does not disagree that vapor mitigation systems can be effective for reducing immediate threats. However, removal actions, such as installation of vapor intrusion mitigation systems, are not intended to permanently address the source of the contamination. Additionally, removal actions have statutory limitations on the amount of funding for conducting removal actions. These limitations may restrict EPA's ability to rely on removal authority alone to fully address subsurface intrusion issues. Congress included in CERCLA Section 104 the Superfund remedial program, which can address releases which cannot be adequately responded to by the Superfund removal program.* *Furthermore, unless the removal program is able to remediate the source of the underlying contamination, there is no mechanism to continually monitor the site to determine if the contaminant source may have migrated to previously unaffected areas.*
C. The Proposal Will Not Advance The Agency's Efforts To Establish National Consistency In Evaluating Vapor Intrusion Concerns	*EPA considers the addition of the SsI component to the HRS as advancing the agency's efforts to establish national consistency for evaluating sites with subsurface intrusion issues for the reasons presented in the responses below.*
EPA indicates that including a VI component in HRS will further its goal of ensuring national consistency in addressing intrusion concerns. While suggesting a lack of consistency among VI programs of the various states, the proposal fails to explain how assessing VI in the HRS will further consistency. This is particularly true since the proposal acknowledges that no additional funding is likely and that, as a result of the additional burden of conducting a VI investigation, EPA is likely to fund fewer assessments each year. EPA suggests that the proposal would allow it to provide funding for VI investigations as part of the pre-listing activities through cooperative agreements with states, but does not indicate how this funding shift would facilitate consistency.	*The addition of the subsurface intrusion component will ensure national consistency in that it establishes what the Superfund remedial program role will be in addressing sites that would not qualify for the NPL without the addition of the SsI component. EPA considers the addition to the HRS along with the VI guide will help ensure national consistency in addressing VI sites* *EPA, in dialogue with other federal agencies, states and tribes, determines the most appropriate mechanism to address the threat posed by hazardous waste sites. EPA often defers sites to other EPA, state, tribal, or federal cleanup authorities, based on whether it is likely that the threat posed by the site will likely be adequately addressed. While some states/tribes have programs to address subsurface intrusion contamination, they often have limited authority and resources, and variable remediation criteria. The availability of the federal remedial authority and the more comprehensive site assessment program complements and strengthens these programs.* *If states and tribes are conducting Superfund site assessments on behalf of EPA or if they are performing the assessments to determine if the sites are*

Comment	Response
	eligible for Superfund, they can receive funding from EPA through cooperative agreements. The overall appropriated Superfund budget as well EPA's cooperative agreement budget for performing site assessments has remained relatively steady (or gone down) since 2010; therefore, EPA does not expect additional site assessments will be conducted as a result of this rulemaking."
Given limited federal resources, the responsibility for evaluating and addressing VI concerns is likely to remain with the state regulatory authority. As EPA indicates, a large number of states have developed guidance for addressing VI issues. For those states without their own guidance, OSWER released a technical guide in 2015 which states can use as a basis for their VI efforts. Rather than providing limited funds to site investigations, or adding a small number of VI sites to the NPL, EPA can best further national consistency in approaching VI issues by providing guidance that is both clear and reasonable. This was the conclusion of EPA's Inspector General in 2009 when it noted that a lack of final VI guidance impedes efforts to address indoor air risks. While the Agency finalized the guidance in 2015, the document is often vague and fails to provide a clear decision framework for states to follow. EPA should also avoid the use of controversial animal studies as a basis for establishing remediation limits that cause contention, confusion, and hardship among the affected community, responsible parties, and regulators, such as the recent reference values for trichloroethylene (TCE).	*CERCLA mandates that EPA establish a remedial program to address releases or potential releases of a hazardous substance. Section 300.420 specifies the site assessment process, which evaluates sites for long term remedial action and includes a remedial PA (section 300.420 (b) of the National Contingency Plan [NCP]) and remedial SI (section 300.420 (c) of the NCP).* *EPA agrees that in many cases there are alternative ways to address some SsI sites, however not all SsI sites can be addressed under non-Superfund authorities and programs. EPA typically only considers placement of sites on the NPL when other channels have been exhausted. To address sites not addressed under state programs, it is necessary for these sites to be placed on the NPL to enable use of Superfund remedial authority.* *Without the SsI component addition to the HRS, sites with SsI issues cannot be placed on the NPL and EPA cannot use Superfund remedial authority and funding to address those sites. Without the HRS SsI Addition, EPA's VI Guide or any other guidance would not be applicable to sites that need to be addressed using Superfund remedial authority. EPA considers the combination of the HRS SsI addition and the 2015 Guide will make VI investigations more consistent and the VI Guide has been adopted by many states and other federal agencies as a standard framework for conducting VI investigations.* *EPA notes that the availability of the federal remedial authority and the more comprehensive site assessment program complements and strengthens state and other SsI cleanup programs.* *Regarding the commenter's statement about use of animal studies as a basis for establishing remediation limits, this is a technical comment on a subject outside the scope of the rulemaking—the subject of a toxicological value developed by EPA for one substance does not directly pertain to the HRS Addition.*
III. Superfund Is Not the Only Approach to Addressing VI Contamination on a National Basis A number of programs, both state and federal, have been employed to investigate and, when necessary, address VI concerns. A majority of states have developed VI guidance and EPA has developed guidance for those states without their own guidelines. In addition, EPA evaluates potential VI exposures at existing NPL sites and has used its removal authority under Superfund to address VI concerns at a number of non-NPL sites.	*EPA agrees that in many cases there are alternative ways to address some SsI sites, however not all SsI sites can be addressed under non-Superfund authorities and programs. EPA typically only considers placement of sites on the NPL when other channels have been exhausted. EPA, in dialogue with other federal agencies, states and tribes, determines the most appropriate mechanism to address the threat posed by hazardous waste sites. EPA often defers sites to other EPA, state, tribal, or federal cleanup authorities, based on whether it is likely that the threat posed by the site will likely be adequately addressed. While some states/tribes have programs to address subsurface intrusion contamination, they often have limited authority and resources, and variable remediation criteria. The availability of the federal remedial authority and the more comprehensive site assessment program complements and strengthens these programs.* *EPA has statutory limitations on the amount of funding for conducting removal actions. These limitations may restrict EPA's ability to rely on removal authority alone to fully address subsurface intrusion issues. Congress included in CERCLA Section 104 the Superfund remedial program, which can address releases which cannot be adequately responded to by the Superfund removal program.* *A site with immediate risks to a population that can be mitigated by response actions does not preclude it from being addressed by the remedial program. EPA's Superfund removal program has the ability to quickly respond to immediate threats to public health and the environment from the release and a removal action can be implemented regardless of NPL status to eliminate or reduce the threat of a release. However, removal actions, such as installation of vapor intrusion mitigation systems, are not intended to address the source of the contamination. In addition, removal actions may not address a long-term chronic VI issue or address future risk due to further migration of the subsurface contamination. If indoor air concentrations do not rise to the level of an imminent threat , the removal program may not have the authority to install mitigation systems, even though a long-term threat may exist.*
A. The Vast Majority Of States Have Guidance For Addressing Vapor Intrusion Issues	
Since EPA issued draft VI guidance in 2002, 48 of the 50 states have developed VI guidelines either as stand-alone documents or as part of broader remediation guidance. This total includes the following – - 24 states that have developed, or are developing, specific VI guidance, - 10 states that include VI guidelines in broader remediation guidance,	*That some states have VI guidelines and existing VI remediation programs does not preclude the need for the ability of EPA to address those sites cannot be addresses through other mechanisms, particularly for those states that do not have VI programs or guidelines. EPA recognizes the efforts of states to develop guidance for addressing sites with subsurface Intrusion. While some states/tribes have programs to address subsurface intrusion contamination, they often have limited authority and resources, and variable remediation criteria. The availability of the federal remedial authority and*

Comment	Response
- 6 states that include VI guidelines within voluntary cleanup program guidance, and - 8 states that include VI guidelines within cleanup program for underground storage tanks Clearly the absence of specific legislative authority has not impeded the states from developing programs to address VI sites, as suggested by the Agency in the proposal. While the absence of final EPA guidance may have contributed to variability among the state programs, it does not appear to have prohibited the states from developing programs to address VI sites. Even for those few jurisdictions without guidance, it appears that the local agencies are requiring VI investigations as part of their remediation programs, consistent with EPA guidance.	*the more comprehensive site assessment program complements and strengthens these programs.* *Furthermore, simply because states can address SsI threats, it does not mean that a federal process for addressing SsI is not needed. This is demonstrated through States having programs to address the other HRS pathways also, but continue to rely on EPA to place sites on the NPL that they are not able to adequately address. EPA notes that while one state did not support the rulemaking, multiple states and individual commenters have expressed support for this rulemaking.*
Evidence also suggests that there is general consistency in the approach taken by the states in VI investigations, based on the draft guidance provided in 2002 by EPA or on guidance developed subsequently by the Interstate Technology and Regulatory Council (ITRC). The variability in state programs appears to be primarily in the indoor air screening levels they use in assessing the need to conduct further testing or to take remedial action. Variation in the screening levels among state programs is not unique to VI and likely would not be significantly reduced with the implementation of EPA's proposal.	*The purpose of this rulemaking is not to ensure consistency in VI investigations and indoor screening levels across states. The purpose is to add an additional scoring mechanism to the existing HRS, enabling EPA to address subsurface intrusion at sites with a high potential for further investigation. EPA does not dispute that there may be general consistency in approach among states.*
B. Removal and Enforcement Actions Can Be Conducted At Any Site, Regardless Of Its NPL Status	*Superfund removal and enforcement actions may not provide a comprehensive approach to addressing risks from subsurface intrusion at all sites.*
In addition to remedial actions, EPA can conduct removal actions under the Superfund program at both NPL and non-NPL sites. CERCLA limits EPA removal actions paid for with trust fund money to actions lasting 12 months or less and costing $2 million or less, although these limits can be exceeded if EPA determines that conditions for such an exemption are met. Consequently, these actions are typically short-term cleanups for sites that pose immediate threats to human health or the environment. The removal program is more suited to a quick response than long-term cleanup approaches and EPA has conducted thousands of removal actions instead of, or in combination, with long-term cleanups.	*That immediate risks to a population can be mitigated by removal actions does not preclude the need for that site to be further addressed under the Superfund remedial program. EPA's Superfund removal program has the ability to quickly respond to immediate threats to public health and the environment from the release and a removal action can be implemented regardless of NPL status to eliminate or reduce the threat of a release. However, removal actions, such as installation of vapor intrusion mitigation systems, do not necessarily permanently address the source of the contamination and potential future risks, which is the goal of the Superfund remedial program. In addition, removal actions may not address a long-term chronic VI issue. If indoor air concentrations do not rise to the level of an imminent threat , the removal program may not have the authority to install mitigation systems, even though a long-term threat may exist.* *EPA has statutory limitations on the amount of time and funding for conducting removal actions. These limitations may restrict EPA's ability to rely on removal authority alone to fully address subsurface intrusion issues. Congress included in CERCLA Section 104 the Superfund remedial program, which can address releases which cannot be adequately responded to by the Superfund removal program.*
C. Vapor Intrusion Issues Are Currently Being Evaluated At Superfund Sites Although VI is not included in the HRS, the pathway is investigated at NPL sites where VI exposure is suspected. Many of these investigations are conducted by state agencies under cooperative agreements with EPA. These agreements give the Agency the ability to assist state authorities in conducting VI investigations and help to advance consistency among the state programs.	*While there are sites on the NPL with VI contamination, not all sites with VI threats could be placed on the NPL without this addition because there was no mechanism for placing sites with only VI threats. EPA is unsure which sites the commenter is referring to as being addressed by states under cooperative agreements. Regardless, the evaluation of VI at present NPL sites is because the site was placed on the NPL based on an HRS evaluation using a different pathway. As noted in previous responses, states often have limited authority and resources to address SsI at large, complex sites. However, if states or other organizations have the resources and authority to appropriately address SsI, then EPA has no need to pursue listing.*
IV. EPA Has Not Provided Sufficient Information to Assess the Magnitude of Sites Potentially Affected By the Proposal	*It is not necessary to know the details of all the sites in the site inventory to assess the addition of the HRS SsI component for evaluating sites for the NPL. The site inventory was used to identify the type of sites that might need to be addressed to help guide the development of the SsI component. When further detail and specifics were needed for this purpose the information from the 11 Test Sites sufficed and was presented in Appendix D of the TSD at proposal.*
EPA has suggested that more than 1,000 sites are suspected of having VI issues and may warrant consideration for inclusion on the NPL based on the addition of VI to the HRS. Without further information it is not possible to assess the nature of the VI concern at the vast majority of the sites. In the absence of this information, it is difficult, if not impossible, to assess the potential impact of the proposal. Many of the sites are included as a result of state efforts to identify potential VI sites, for example, and likely would be deferred to these ongoing efforts as part of a pre-CERCLA screening process under the proposal. In fact, nearly half of the sites (5) of the 11 Tier 1 sites already have been the subject of VI investigations.	
A. EPA Has Not Established That Subsurface Intrusion Other Than Vapor Intrusion Is A Significant Issue	*It is not necessary for EPA to establish that ground water intrusion is an issue at multiple sites. The Congressional mandate in CERCLA 105(a)(8)(A)is to assess risk to the maximum extent feasible. Without inclusion of ground water intrusion in the SsI component, the threat posed by ground water intrusion could not be addressed to the maximum extent feasible. It is not necessary to establish the significance of this threat to comply with this*
In its proposal, EPA characterizes groundwater intrusion as an "emerging issue" and offers minimal information	

Comment	Response
to support its contention that such sites present unacceptable human exposure that may not otherwise be cleaned up. The one site for which information is provided in the Technical Support Document (the Garfield Ground Water Contamination Site), however, already has been included on the NPL. While groundwater intrusion may turn out to be a significant emerging issue, the proposal has not established that considering it in the HRS is warranted.	*mandate.* *Regarding the commenter's assertion that the Garfield site provides no support for the proposed rule this is incorrect. The Garfield provides support for the need for addressing ground water contaminant intrusion into regularly occupied structures. The rule includes a component for evaluating subsurface intrusion, which includes both vapor intrusion and ground water intrusion. The Garfield ground water intrusion site demonstrates the need for the SsI component. The presence of this residue posed a significant threat to public health; however, the site could not be evaluated under the 1990 HRS due to the lack of a mechanism to evaluate human exposure resulting from intrusion of contaminated ground water (subsurface intrusion contamination). The only viable option to place the site on the NPL was to rely on the Agency for Toxic Substances and Disease Registry (ATSDR) to make a determination that the exposure at the site posed a significant threat to public health. The decision to include sites on the NPL based on a determination by the ATSDR is made infrequently because the HRS is the primary mechanism for placing a site on the NPL.*
As described elsewhere in this letter, a national approach has been developed to consider VI issues – based on federal and state programs using guidance provided by EPA. The proposal does not present evidence to suggest that the identified VI sites would otherwise not be considered under the existing programs. Rather, several of EPA's sources for identifying sites appear to come from ongoing VI programs at the state level.	*EPA agrees that in many cases there are alternative ways to address some SsI sites, however not all SsI sites can be addressed under non-Superfund authorities and programs. In fact, most NPL sites are identified by the states for inclusion on the NPL, and state approval is solicited prior to placement of a site on the NPL. EPA typically only considers placement of sites on the NPL when other channels have been exhausted. EPA, in dialogue with other federal agencies, states and tribes, determines the most appropriate mechanism to address the threat posed by hazardous waste sites. EPA often defers sites to other EPA, state, tribal, or federal cleanup authorities, based on whether it is likely that the threat posed by the site will likely be adequately addressed. While some states/tribes have programs to address subsurface intrusion contamination, they often have limited authority and resources, and variable remediation criteria. The availability of the federal remedial authority and the more comprehensive site assessment program complements and strengthens these programs.* *Other EPA programs such as the Resource Conservation and Recovery Act (RCRA) and the Brownfields program have limited authority and ability to address all subsurface intrusion threats. The RCRA Corrective Action/Enforcement program is only applicable at sites currently subject to RCRA permitting or sites otherwise reachable by RCRA's enforcement activities. Furthermore, RCRA is a delegated program in many states and not all states recognize subsurface intrusion as a significant issue. RCRA sites with subsurface intrusion issues may not be addressable in all states. Also, governmental entities with site-specific Brownfields assessment and/or revolving loan fund cleanup may only use grant funds on the selected eligible property. While SsI sites may be eligible for Brownfields cleanup grants, site or property-specific limitations may not allow for permanent remediation.*
B. **Sufficient Information Is Lacking On The 1,073 Vapor Intrusion Sites Listed In Technical Support Document**	*It is not necessary to have site-specific information on the 1,073 VI sites listed in the proposal TSD to effectively comment on the proposed addition of the SsI component to the HRS. The 1,073 VI sites were identified to support the development of the rulemaking, not to justify the need for the rulemaking. EPA conducted a screening-level assessment of sites with identified subsurface intrusion threats. As a first step in collecting the list of sites potentially affected by the final rule, EPA consulted with site assessment experts that work in Superfund to identify potential site candidates. EPA also reached out to state counterparts, in particular to state programs that were known to have taken a more thorough investigation of the subsurface intrusion pathway at sites. Through this process, EPA identified approximately 1,073 sites that either had shallow ground water contamination, vapor producing chemicals, nearby populations (Tiers 3 or 4) or sites with sampling data demonstrating a vapor intrusion issue (Tier 1 and 2). These sites are*

Comment	Response
For all but 11 of the VI sites identified in Appendix A of the Technical Support Document, EPA has provided minimal data (i.e., the state in which the site is located and the list(s) from which the site is derived). No information is provided on the magnitude and extent of the VI contamination, the number of people potentially impacted, or other parameters necessary to assess the likelihood that the site would receive a high SsI score. In fact, it would appear that the score for the vast majority of sites would be quite low. Seven of the sources of sites referenced by EPA represent programs where VI assessments are actively underway – including the Superfund removal list and VI lists developed by the states of Colorado, Maryland, New York, and Utah. Three of the four remaining sources are derived from keyword searches; two of these sources are searches within the same database. While the list of sites presented in the Technical Support Document may demonstrate the breadth of potential VI concerns, it does little to support the Agency's proposal to add a new HRS pathway. On the contrary, the data presented suggest that EPA has narrowed the list of VI sites from the "up to 37 sites" suggested to GAO by EPA Headquarters and Regional staff in 2010 to the 11 Tier 1 sites described in Appendix D. The Agency's analysis is incomplete, however. Based on the information provided in the Appendix, the list of 11 sites can be further reduced since two of the sites (Sites 5 & 9) threaten drinking water wells and likely would receive a high score under the current HRS. Another two sites (Sites 1 & 7) are close to day care facilities which would allow EPA to take removal action under Superfund without having to add them to the NPL. Another site (Site 4) is assigned an HRS of 24.33 and would not qualify for addition to the NPL even under the proposed scoring system. Of the remaining six sites, only one (Site 3) is located in a jurisdiction that does not have an active VI remediation program.	*not currently on the NPL, and all have a potential or identified SsI threat. Within the group of sites potentially affected by the HRS SsI Addition, EPA defined four categories:* • *Tier 4: Sites identified as having a suspected SsI threat based on EPA's Superfund database and Agency for Toxic Substances and Disease Registry keyword searches, as well as EPA or state self-identification, but for which no sampling data were obtained;* • *Tier 3: Sites identified as having characteristics or evidence that indicate SsI may have occurred or will occur;* • *Tier 2: Sites identified as having an SsI threat documented by subslab, crawl space, or indoor air samples, but insufficient HRS-required evaluation factors to qualify for the NPL; and* • *Tier 1: Sites identified as having an SsI threat with documented actual exposure of a sufficient number of targets with enough other HRS-required evaluation factors to suggest the site may qualify for the NPL.* *EPA selected the Tier 1 sites for use in testing the SsI component evaluation process. The 11 Test Sites had documentation of indoor contamination due to subsurface intrusion based on actual sampling data and other typically HRS-required data. Of the 11 sites scored, 9 were projected to score 28.50 or higher using only the SsI component. One site was projected to score 28.50 or higher only by including both the scores from the SsI component evaluation and the ground water migration pathway evaluation in the site score. It was uncertain whether these sites would qualify for the NPL when they were chosen as Test Sites, as the SsI scoring process had not been developed.* *That 10 of the 11 Test Sites have a projected HRS site score of 28.50 or greater using the SsI component is not an indication that the addition of the SsI component will result in a large number of SsI sites qualifying for the NPL; this would be a possible projection if the Test Sites were chosen randomly so as to represent a typical SsI site. The Test Sites were not randomly chosen, but instead were specifically chosen because they have a documented subsurface intrusion threat at the sites and sufficient available data to test all parts of the SsI component. Appendix B of the Technical Support Document (TSD) for this final rulemaking provides a summary of these scoring evaluations.*
V. The Proposal Would Not Provide Additional Funds to Perform Site Remediation	
Based on the analyses developed by EPA and GAO, the primary obstacle to addressing VI concerns at contaminated sites is a lack of resources, not the inability to consider VI as a basis for adding these sites to the NPL. Yet EPA is clear that the current proposal would not provide additional funding for assessing VI at HRS sites or for remediating these sites, should any be added to the NPL. The proposal acknowledges, in fact, that implementation of the proposal would not only require that funds be diverted from other sites, but that fewer assessments would likely be conducted as a result of the increased cost of assessing the VI pathway.	*The purpose of the rulemaking is not to obtain additional funds to perform site remediation, but to better identify sites for placement on the NPL and to prioritize them for further investigation. Funding for such investigations is not the subject of this rulemaking. How EPA prioritizes funding for these further investigations is a separate issue. The overall appropriated Superfund budget as well EPA's cooperative agreement budget for performing site assessments has remained relatively steady (or gone down) since 2010; therefore, EPA does not expect additional site assessments will be conducted as a result of this rulemaking. EPA does not expect that this change will result in additional site assessments being conducted per year or placement of more sites on the NPL per year. The pipeline of sites will be reviewed to identify those sites that pose the highest risk and prioritized accordingly. This is not a change to how EPA currently evaluates and prioritizes sites for the NPL; EPA will simply have an additional mechanism to identify and address sites that pose the greatest risk. Because assessing the worst sites first is a priority, EPA will continue to identify the sites posing the highest risk or potential risk and develop a strategy to assess those sites in a timely manner, while balancing their other site assessment needs.*
Addition of a new HRS pathway based on VI runs contrary to the CERCLA mandate to use the NPL to address the highest priorities for long-term remedial action based on the potential threat to drinking water sources and the largest number of people impacted. Rather than create a new pathway for remedial activity under Superfund, EPA should evaluate whether it can more effectively use its removal authority to address significant VI concerns that are not being, or cannot be, addressed under the other existing programs.	*The revision to the HRS to add a subsurface intrusion component is not in conflict with the CERCLA 105 mandate to prioritize drinking water sites. The priority given by EPA under CERCLA to sites with a high risk of populations exposed to hazardous substances in drinking water has not decreased with the addition of a subsurface intrusion component to the HRS. In fact, the score for some sites with contaminated drinking water supplies may increase because sites with contaminated drinking water may also be associated with subsurface intrusion contamination and the combination of the ground water migration pathway score and the SsI component score may increase the overall site score. Furthermore, EPA notes that drinking water is a priority identified by CERCLA, but it is not the only priority identified in CERCLA 105, which also mandates the prioritization of dangers of direct human contact, for which SsI is one example.* *The addition of the SsI component does not change the priority given to drinking water sites. It does not change the scoring of contaminated drinking water supplies under the HRS, reduce in anyway the overall HRS score for any site based on drinking water contamination (or any other threat due to exposure to released hazardous substances in the HRS), or change the site score of 28.50 being the HRS score that qualifies sites for placement on the NPL. If a site qualifies for placement on the NPL based on its HRS score reflecting drinking water contamination prior to the addition of the SsI component, it will continue to do so. Adding an evaluation of the SsI component can only increase an overall site score. The algorithm used to combine pathways scores to obtain an overall site score results in an increase in the overall site score with the evaluation of additional pathways, components*

Comment	Response
	and threats scored. In fact, the SsI addition may raise the overall site score at some sites with ground water drinking water contamination from below the 28.50 cut-off score to above it. This may occur because, as stated above, a site's HRS score can increase with the scoring of additional threats. Sites with ground water contaminated by volatile substances and used for drinking water are also sites at which the ground water contamination may volatilize and intrude into overlying regularly occupied structures. Thus, a site at which ground water contamination has occurred but does not have an HRS score above 28.50 based only on the ground water threat, may have an overall HRS site score above 28.50 based on the combination of the scores for the contaminated drinking water and SsI threats. *Furthermore, EPA notes that CERCLA 118 refers to CERCLA sections104 and 108, which address activities that occur pre- or post- NPL-listing, and not to the section of CERCLA that addresses site ranking using the HRS, which is addressed in CERCLA section 105. CERCLA Section 105 and specifically 105(a)(8)(A) requires EPA to prioritize sites based on "the population at risk, the hazard potential of hazardous substances at such facilities, the potential for contamination of drinking water supplies, the potential for direct human contact [and] the potential for destruction of sensitive ecosystems." Since subsurface intrusion contamination is a direct human contact threat, the addition of a subsurface intrusion component, which addresses this threat, is mandated by CERCLA.* *Regarding the use of EPA's removal authority, EPA's Superfund removal program has the ability to quickly respond to immediate threats to public health and the environment from the release; a removal action can be implemented regardless of NPL status to eliminate or reduce the threat of a release. However, removal actions, such as installation of vapor intrusion mitigation systems, are not intended to necessarily address the source of the contamination. For example, removal actions can be used as stopgap measures to break the exposure chain until a permanent remedy is implemented. In addition, CERCLA has statutory limitations on the amount of funding and time for conducting removal actions. These limitations may restrict EPA's ability to rely on removal authority alone to fully address subsurface intrusion issues. Congress included in CERCLA Section 104 the Superfund remedial program, which can address releases which cannot be adequately responded to by the Superfund removal program.*
VI. Conclusion The available information indicates that the vast majority of states currently include VI in their site assessment and remediation efforts. While some aspects of these programs may vary from state to state, there is considerable consistency in the approach states take in conducting VI assessments. As a consequence, there is no need for a new federal approach to evaluating VI contamination. In those few instances where federal attention may be warranted, the Superfund remediation program is neither appropriate nor necessary. The NPL program is designed for long-term remediation of sites, not for the rapid response that is sometimes necessary at VI sites. Federal action at VI sites is better addressed through the Agency's removal authority under Superfund, which EPA has used effectively at thousands of sites. The proposal to add an SsI component to the HRS, moreover, would add significant additional burden to an already strained Superfund budget. As proposed, it would divert critical resources from the assessment of high priority NPL sites and consequently threaten the overall performance of the program. These potential impacts on the integrity of the Superfund program, combined with the Agency's failure to identify a problem that needs to be solved, provide a strong rationale for abandoning the proposed changes to the HRS.	*As documented in all ACC-specific comments, EPA has demonstrated the necessity of the addition of the SsI component to the HRS to meet the Congressional mandate to address risk to the maximum extent feasible.*

Submitter: 0101 - James R. Roewer, Utility Solid Waste Activities Group (USWAG)

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Comment	Response
USWAG commends the Agency for its engagement of the public at the inception of this rulemaking in 2011, including holding three public listening sessions around the country at which citizens could present their views on the potential addition of a vapor intrusion pathway to the HRS, as well as meeting with interested parties and stakeholders (including USWAG members). The Agency went to great lengths at the earliest stages of this rulemaking—when the potential addition of a vapor component to the HRS was presented only as a vague and general concept, free of any details regarding how such a component would be structured or counted—to solicit public input. The preamble to the Proposal and EPA's detailed technical support documents further suggest that, in the nearly five years since the close of the comment period on EPA's initial notice of the potential rulemaking, the Agency has put significant time and resources into the development of the current Proposal.	*EPA appreciates the commenter's support for the agency's public engagement during the rulemaking process.*
It is therefore unfortunate that the public has not been provided with adequate time to review the Proposal and supporting documents in order to provide meaningful input on the many complex technical issues raised by the Proposal. USWAG is disappointed in EPA's refusal to extend the comment period by another sixty days—a reasonable amount of time in light of the five years it took EPA to develop this Proposal—despite timely requests to do so from USWAG and others. EPA's refusal to grant these extension requests is especially perplexing in light of the fact that the Agency is under no statutory or court-ordered deadline to promulgate a final rule.	*While EPA acknowledge that the proposed rule raises technical issues that require consideration, EPA considers that 60 days plus the additional 25 days that the rule was available prior to publication provides ample time for all interested parties to review the information and prepare comments.*
The Superfund program has long recognized vapor intrusion as a serious concern, and vapor intrusion is routinely addressed at sites that are listed on the National Priorities List ("NPL"). Though vapor intrusion, whether suspected or documented, does not currently factor into HRS scoring system used to place sites on the NPL, the reality is that most sites with an actual vapor intrusion concern will receive a sufficiently-high score on the HRS using only the existing pathways due to underlying contamination in groundwater or soil. And in cases where vapor intrusion is identified and found to pose an immediate health risk, regardless of whether the site has been placed on the NPL, that threat can be adequately addressed through EPA's removal authority under CERCLA or through other existing channels on the state or local level. The focus on vapor intrusion has only increased in recent years on both federal and state levels, as EPA has developed a wealth of vapor intrusion tools (including the OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air, issued by the Office of Solid Waste and Emergency Response ("OSWER") in June 2015 ("OSWER VI Guidance")), which in turn have enhanced state efforts to develop and update their own guidance and resources.	*While many sites with vapor intrusion issues may qualify for the NPL based on the score obtained by evaluations using other HRS pathways, this is only correct if a site exhibiting an SsI threat also happens to also involve sufficient threat/targets as scored under other pathways. That is, the 1990 HRS has no method for evaluating threats posed by SsI contamination. Therefore, it is only fortuitous that sites with SsI contamination have been placed on the NPL based on the threat via other pathways. For example, the ground water pathway only evaluates the threat posed by contaminated ground water if there is an indication that ground water is consumed. Similarly, the soil exposure pathway evaluates the threat posed by contaminated surfaces (e.g., surface soil) if there is an indication of human exposure. The threat to a population via indoor contamination is not considered in these other 1990 HRS pathways; thus it is possible for SsI sites involving ground water contamination or soil contamination to not achieve a site score of 28.50 or greater under the 1990 HRS ground water migration pathway or soil exposure pathway—effectively underestimating the relative risk posed by the site and underserving those populations subject to the threat of subsurface intrusion.* *Furthermore, EPA is modifying the HRS to comply with the statutory requirements in the 1986 Superfund Amendments and Reauthorization Act (SARA), which added section 105(c)(1) to CERCLA requiring EPA to amend the HRS "to assure to the maximum extent feasible, that the HRS accurately assess the relative degree of risk to human health and the environment posed by sites and facilities subject to review."* *Contamination due to subsurface intrusion is a known risk to human health and the ability to evaluate those risks is consistent with the CERCLA 105 mandate. When the 1990 HRS was undergoing revision, EPA did not include an evaluation of the risk posed by subsurface intrusion, as the state of the science would not have supported it at that time. As part of the development of this rule, EPA identified priority sites with significant contamination due to SsI that would not qualify for possible placement on the NPL using the 1990 HRS. With the addition of the SsI component to the HRS, sites can now be evaluated more comprehensively to consider the relative risk posed by a site.* *Regarding alternative ways to address SsI sites, EPA agrees that in many cases there are alternative ways to address some SsI sites, however not all SsI sites can be addressed under non-Superfund authorities and programs. EPA typically only considers placement of sites on the NPL when other channels have been exhausted. EPA, in dialogue with other federal agencies, states and tribes, determines the most appropriate mechanism to address the threat posed by hazardous waste sites. EPA often defers sites to other EPA, state, tribal, or federal*

Comment	Response
	cleanup authorities, based on whether it is likely that the threat posed by the site will likely be adequately addressed. While some states/tribes have programs to address subsurface intrusion contamination, they often have limited authority and resources, and variable remediation criteria. The availability of the federal remedial authority and the more comprehensive site assessment program complements and strengthens these programs. *Other EPA programs such as the Resource Conservation and Recovery Act (RCRA) and the Brownfields program have limited authority and ability to address all subsurface intrusion threats. The RCRA Corrective Action/Enforcement program is only applicable at sites currently subject to RCRA permitting or sites otherwise reachable by RCRA's enforcement activities. Furthermore, RCRA is a delegated program in many states and not all states recognize subsurface intrusion as a significant issue. RCRA sites with subsurface intrusion issues may not be addressable in all states. Also, governmental entities with site-specific Brownfields assessment and/or revolving loan fund cleanup may only use grant funds on the selected eligible property. While SsI sites may be eligible for Brownfields cleanup grants, site or property-specific limitations may not allow for permanent remediation. EPA's Superfund removal program has the ability to quickly respond to immediate threats to public health and the environment from the release and a removal action can be implemented regardless of NPL status to eliminate or reduce the threat of a release. However, removal actions, such as installation of vapor intrusion mitigation systems, are not intended to and may not address the source of the contamination.*
Moreover, vapor intrusion sites frequently consist of only a small number of residential and commercial buildings, frequently in situations where high levels of chlorinated solvents can be found in close proximity to the structures' foundations or to the ground surface. (6) In those buildings that are impacted by vapor intrusion, impacts are commonly only to lower-level floors and/or subunits within that building. The relatively small scale of populations generally affected by vapor intrusion further underscores the need for state and local handling of these sites. Such a response is far more appropriate than inclusion on the NPL, which is intended to address contaminated sites of the highest priority on a national level and which explicitly recognizes affected population as a factor in the listing decision. (6) As discussed elsewhere in these comments, where vapor intrusion problems are identified at larger sites, such as former military bases, a host of remedial options exist for addressing these sites, regardless of NPL listing status.	*The purpose of CERCLA is to address sites with significant risk to human health that have not or cannot be addressed under other programs. It is EPA's experience that despite other programs that can address SsI, there are limitations (e.g., statutory exclusions, funding, resources) that prevent other programs from addressing the contamination. Sites that may present a lower risk to populations than those that qualify for the NPL or are statutorily excluded from being addressed under CERCLA are deferred to the appropriate organization. This is part of EPA's standard site assessment process that has not changed with the addition of the SsI component. However, under the 1990 HRS those sites with the potential to put populations at risk due to contamination from SsI could not be evaluated for placement on the NPL. Revising the HRS to include an SsI component fulfills EPA's statutory obligation to accurately assess the relative degree of risk to human health and the environment.* *Regarding the comment that the NPL be used only for the "highest priority" sites, EPA places eligible sites on the NPL pursuant to authorities under CERCLA and the National Contingency Plan (NCP). An HRS site score of 28.50 or greater represents the determination that the relative risk posed by the site warrants further investigation under CERCLA. While affected population is indeed a factor in this scoring mechanism (via the HRS target factors), it is not the sole score driving factor: the likelihood of release factors and waste characteristics factors may also be driving site score at sites where the people affected are not great in number; in these situations, the relative risk posed to human health—even to a smaller population—may be significant enough that NPL listing is warranted.*
The other prong of EPA's proposed SSI component—groundwater intrusion—appears to be poorly understood by EPA and others, and motivated by concerns that are based on information that is anecdotal at best. In explaining this aspect of the SSI component in the preamble to the Proposal, EPA relies heavily on a single incident where chromium-contaminated groundwater entered residential basements and, "after the water receded, or evaporated, a precipitate of chromium remained as a residue." EPA goes on to state that, in addition to this one site, EPA regional site assessment programs throughout the country have identified seven more sites where intrusion of contaminated groundwater "is a potential issue." EPA provides little detail regarding this handful of sites, and it is unclear whether these eight sites have been or would be NPL-eligible based on current HRS scoring, or, if not, how likely it is they would score 28.5 or higher based on the proposed new HRS scoring structure. EPA has not presented any meaningful data suggesting that groundwater intrusion is a significant concern at sites across the country or that regulatory action is necessary to address that concern. Further, even if sufficient information did exist to demonstrate that regulatory action of some kind is warranted, EPA has offered no evidence to suggest that the proposed change to the HRS is the best (or even an adequate) way to address concerns associated with groundwater intrusion. The inclusion of a groundwater intrusion component in the HRS scoring process will prove an inefficient use of resources, standing in stark contrast to EPA's mandate under CERCLA to address the sites posing the greatest risk to health and the	*As identified in the preamble to the HRS SsI Addition at proposal, ground water intrusion is an emerging threat for which more site-specific information will be gathered in the future. However, despite the continuing addition to the understanding of ground water intrusion, it still represents a threat that EPA must consider and address per CERCLA as modified by SARA in section 108(a)(8)(a).as discussed below.* *The commenter is correct that EPA detailed in the preamble to the HRS SsI Addition at proposal one site at which contaminated ground water intrusion had left chromium residue in residential basements, and that EPA noted seven additional sites have been identified where contaminated ground water intrusion is a possible threat.* *The preamble at proposal also explained that these sites represent a possible threat to human health that cannot be evaluated with the 1990 HRS. The preamble stated that "[a]s EPA further explores this emerging issue, the agency considers it likely that other ground water intrusion sites requiring evaluation will be identified. The inventory of sites, identified by EPA, with a possible threat from contaminated vapor or ground water intruding into overlying regularly occupied structures is not representative of the magnitude of the potential scope of sites with subsurface intrusion contamination. EPA identified these sites based on currently available information to initially assess the subsurface intrusion problem." And the preamble clarified that "[i]n the case of ground water intrusion, the issue is still emerging." The preamble further stated that "EPA recognizes that a degree of inherent uncertainty is associated with compiling an inventory of sites with potential subsurface intrusion problems and that additional analysis is necessary, especially in cases where little information exists."*

Comment	Response
environment.	*However, despite the evolving understanding of the scale of the threat posed by contaminated ground water intrusion, it constitutes a threat that EPA must address. As the preamble to the HRS SsI Addition at proposal explained, EPA is required to ensure "to the maximum extent feasible, that the hazard ranking system accurately assesses the relative degree of risk to human health and the environment posed by sites and facilities subject to review." 42 U.S.C. 9605(c)(1), as mandated by the Superfund Amendments and Reauthorization Act (SARA) amendments to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).* *Regarding the commenter's concern that "inclusion of a groundwater intrusion component in the HRS scoring process will prove an inefficient use of resources, standing in stark contrast to EPA's mandate under CERCLA to address the sites posing the greatest risk," this is not correct—recognition of ground water intrusion within the SsI component does not somehow represent a low risk site being listed on the NPL at the expense of sites "posing the greatest risk." That is, the aspects of the SsI component that address ground water intrusion have been designed to fit within that component in a manner consistent with the rest of the SsI component, and maintaining scoring balance with the other HRS pathways/components. The commenter has not offered any reason to question this balance. Therefore, if an HRS site score equals or exceeds 28.50 based on contaminated ground water intrusion effects, that site warrants NPL listing and further investigation under CERCLA.* *Regarding the assertion that "EPA has offered no evidence to suggest that the proposed change to the HRS is the best (or even an adequate) way to address concerns associated with groundwater intrusion," as stated above, EPA is meeting its requirements under SARA by recognizing this threat in the HRS evaluation. As also mentioned above, the commenter has not offered any specific critiques of the manner in which contaminated ground water intrusion is addressed in the SsI component.*
In light of the foregoing, EPA has failed to demonstrate that its proposed change to the HRS is necessary to address either vapor intrusion or groundwater intrusion concerns.	*The addition of the Subsurface intrusion component to the HRS is necessary because under the 1990 HRS those sites with the potential to put populations at risk due to contamination from SsI could not be evaluated for placement on the NPL. Revising the HRS to include an SsI component fulfills EPA's statutory obligation to accurately assess the relative degree of risk to human health and the environment. And, ground water intrusion is an emerging threat for which more site-specific information will be gathered in the future. However, despite the continuing addition to the understanding of ground water intrusion, it still represents a threat that EPA must consider and address per CERCLA as modified by SARA in 108(a)(8)(A).*
If issued in final form, the Proposal is almost certain to drive a significant increase in costs associated with preliminary assessments and site inspections, further burdening the already strained Superfund budget.	*Given the variable nature of vapor intrusion it is possible additional sampling and different types of samples beyond that of an SI performed for evaluating sites using other parts of the HRS may be required for the HRS SsI component at some sites. However, an SsI component evaluation is still designed to be used with relatively limited data; the sampling required to evaluate a site using the HRS SsI component is similar to that required for evaluating sites using other HRS pathways and components and is within the scope of a screening assessment. Furthermore, as is the case with the other HRS pathways, the level of effort required to evaluate a site already varies on a site-by-site basis depending on the size and extent of contamination at the site and the HRS pathways being evaluated. Therefore, it cannot be predicted with certainty that there will be an overall increase in cost or level of effort for any particular site due to the HRS SsI Addition. Furthermore, even if there is an increase in cost for collecting the data necessary to evaluate sites using the SsI component, EPA considers it consistent with Congressional intent and EPA's mandate to protect human health and the environment.*
Despite these costs, the rulemaking is unlikely to achieve more rapid remediation of SSI problems than is already possible.	*EPA agrees that in many cases there are alternative ways to address some SsI sites; however not all SsI sites can be addressed under non-Superfund authorities and programs or under the Superfund removal program. EPA typically only considers placement of sites on the NPL when other channels have been exhausted. EPA, in dialogue with other federal agencies, states, and tribes, determines the most appropriate mechanism to address the threat posed by hazardous waste sites. EPA often defers sites to other EPA, state, tribal, or federal cleanup authorities, based on whether it is likely that the threat posed by the site will likely be adequately addressed. While some states/tribes have programs to address subsurface intrusion contamination, they often have limited authority and resources, and variable remediation criteria. The availability of the federal remedial authority to comprehensively address subsurface intrusion complements and strengthens these programs.* *EPA's Superfund removal program has the ability to quickly respond to immediate threats to public health and the environment from the release and a removal action can be implemented regardless of NPL status to eliminate or reduce the threat of a release. However, removal*

Comment	Response
	actions, such as installation of vapor intrusion mitigation systems, are not intended to address the source of the contamination. EPA has statutory limitations on the amount of funding and time for conducting removal actions. These limitations may restrict EPA's ability to rely on removal authority alone to fully address subsurface intrusion issues. Congress included in CERCLA Section 104 the Superfund remedial program, which can address releases which cannot be adequately responded to by the Superfund removal program.
Further, the inevitable confusion associated with the revised HRS will lead to inconsistency in site assessment and scoring, frustrating EPA's statutory charge to "accurately assess the relative degree of risk to human health and the environment" at contaminated sites throughout the country. The likelihood of over-counting of SSI factors, due to reasons explained elsewhere in these comments, is likely to divert resources from sites that should be a higher priority based on actual risk. EPA should therefore abandon the current rulemaking.	*EPA disagrees with the comment that "confusion associated with the revised HRS will lead to inconsistency in site assessment and scoring" jeopardizing the accurate assessment of relative risk. The SsI component was specifically designed to prevent this by using the conceptual model already used in the HRS. The basis for the approach to the SsI addition (as listed in the preamble to the HRS SsI Addition at proposal) included limiting "the proposed addition to the existing HRS structure to avoid confusion by minimizing the portions of the present HRS that would need to be revised," and utilizing "the existing HRS basic structure and scoring algorithm, and maintaining the relative weighting of the different pathways." As explained elsewhere in this support document, the commenter is incorrect in assertions related to likelihood of over-counting of SsI factors.* *Additionally, actual risk is not evaluated at the stage of the Superfund process at which an HRS evaluation is conducted. Such evaluation is part of a later step following NPL listing of a site.*
I. EPA's Proposal Has Implications Extending Far Beyond the Proposed SSI Component of the Soil Exposure Pathway	
EPA states in the preamble to the Proposal that it "is proposing an addition of one new component" —the SSI component— "to the current [HRS]," and that "[n]o major structural changes to other parts of the HRS are proposed." EPA goes on to state that "[c]omments on unmodified parts of the HRS are not being requested and will not be considered if submitted." Despite EPA's assertion that the Proposal suggests only "narrow technical modifications" to the HRS however, as a practical matter the Proposal would have ripple effects reverberating throughout the entire HRS. These would include the imposition of costs associated with SSI scoring and corresponding diversion of resources for preliminary site assessment and site inspections. Moreover, because the HRS is intended to assess relative risk from one site to another, the Proposal would impact all sites screened under the amended HRS (regardless of whether the SSI component is scored for a given site), and will similarly impact the prioritization of all screened sites. Public comments addressing these issues fall squarely within the scope of the Proposal even if they touch on issues that EPA has not explicitly raised in the Proposal, and should be given due consideration by EPA.	*As noted by the preamble of the HRS SsI Addition at proposal (referred to by the commenter), comments on aspects of the HRS unmodified for the HRS SsI Addition are unrelated to this rulemaking. This rulemaking deals only with the addition of the HRS SsI component to the HRS. Comments on other previously existing portions of the 1990 HRS are outside the scope of this rulemaking. It does not address how or when this component will be evaluated, or how such evaluations will be funded. EPA intends to maintain its existing policies and procedures in this regard. EPA has responded to comments on these topics only so far as to explain this situation.* *Regarding the comment that "because the HRS is intended to assess relative risk from one site to another . . . the Proposal would impact all sites screened under the amended HRS," as explained above, the SsI component was specifically designed to prevent this. The basis for the approach to the HRS SsI Addition (as listed in the preamble to the HRS SsI Addition at proposal) included limiting "the proposed addition to the existing HRS structure to avoid confusion by minimizing the portions of the present HRS that would need to be revised," and utilizing "the existing HRS basic structure and scoring algorithm, and maintaining the relative weighting of the different pathways." As explained elsewhere in this support document, the commenter is incorrect in assertions related to likelihood of over-counting of SsI factors. The existing agency policy for prioritizing sites by relative risk will continue. The pipeline of sites will be reviewed to identify those sites that pose the greatest risk. This is not a change to how EPA currently evaluates and prioritizes sites for the NPL; EPA will simply have an additional mechanism to address sites that pose the greatest risk. Because assessing the worst sites first is a priority, EPA will continue to identify and prioritize the sites posing an unacceptable risk and develop a strategy to assess those sites in a timely manner, while balancing other site assessment needs.*
II. Assessment of Subsurface Intrusion Threats Is Not Consistent With The HRS Scoring Process	
USWAG and its members appreciate that vapor intrusion is a serious concern, and understand EPA's goal in trying to develop an approach to address vapor intrusion earlier in the CERCLA process. For the reasons explained above we believe the existing HRS scoring system, which considers contamination in groundwater and other media that could drive vapor intrusion, and subsequent steps in the CERCLA process already adequately address vapor intrusion concerns.	*EPA disagrees with the commenter's statement that most sites with an actual VI concern will receive a sufficiently high score on the HRS using only the existing pathways. This is only correct if a site exhibiting a VI threat also happens to also involve sufficient threat/targets as scored under other HRS pathways. That is, the 1990 HRS has no method for evaluating threats posed by SsI contamination. Therefore, it is only fortuitous that sites with SsI contamination have been placed on the NPL based on the threat via other pathways. For example, the ground water pathway only evaluates the threat posed by contaminated ground water if there is an indication that ground water is consumed. Similarly, the soil exposure pathway evaluates the threat posed by contaminated surfaces (e.g., surface soil) if there is an indication of human exposure. The threat to a population via indoor contamination is not considered in these other 1990 HRS pathways;*

Comment	Response
	thus it is possible for VI sites involving ground water contamination or soil contamination to not achieve a site score of 28.50 or greater under the 1990 HRS ground water migration pathway or soil exposure pathway—effectively underestimating the relative risk posed by the site and underserving those populations subject to the threat of subsurface intrusion. *Furthermore, EPA is modifying the HRS to comply with the statutory requirements in the 1986 Superfund Amendments and Reauthorization Act (SARA), which added section 105(c)(1) to CERCLA requiring EPA to amend the HRS "to assure to the maximum extent feasible, that the HRS accurately assess the relative degree of risk to human health and the environment posed by sites and facilities subject to review."* *Contamination due to subsurface intrusion is a known risk to human health and the ability to evaluate those risks is consistent with the CERCLA 105 mandate. When the 1990 HRS was undergoing revision, EPA did not include an evaluation of the risk posed by subsurface intrusion, as the state of the science would not have supported it at that time. As part of the development of this rule, EPA identified priority sites with significant contamination due to SsI that would not qualify for possible placement on the NPL using the 1990 HRS. With the addition of the SsI component to the HRS, sites can now be evaluated more comprehensively to consider the relative risk posed by a site. Further, at least one site is currently being evaluated using the SsI component and the documentation is being prepared to support proposal of this site to the NPL as soon as this rule is promulgated.* *Regarding alternative ways to address SsI sites, EPA agrees that in many cases there are alternative ways to address some SsI sites, however not all SsI sites can be addressed under non-Superfund authorities and programs. EPA typically only considers placement of sites on the NPL when other channels have been exhausted. EPA, in dialogue with other federal agencies, states and tribes, determines the most appropriate mechanism to address the threat posed by hazardous waste sites. EPA often defers sites to other EPA, state, tribal, or federal cleanup authorities, based on whether it is likely that the threat posed by the site will likely be adequately addressed. While some states/tribes have programs to address subsurface intrusion contamination, they often have limited authority and resources, and variable remediation criteria. The availability of the federal remedial authority and the more comprehensive site assessment program complements and strengthens these programs.* *Other EPA programs such as the Resource Conservation and Recovery Act (RCRA) and the Brownfields program have limited authority and ability to address all subsurface intrusion threats. The RCRA Corrective Action/Enforcement program is only applicable at sites currently subject to RCRA permitting or sites otherwise reachable by RCRA's enforcement activities. Furthermore, RCRA is a delegated program in many states and not all states recognize subsurface intrusion as a significant issue. RCRA sites with subsurface intrusion issues may not be addressable in all states. Also, governmental entities with site-specific Brownfields assessment and/or revolving loan fund cleanup may only use grant funds on the selected eligible property. While SsI sites may be eligible for Brownfields cleanup grants, site or property-specific limitations may not allow for permanent remediation. EPA's Superfund removal program has the ability to quickly respond to immediate threats to public health and the environment from the release and a removal action can be implemented regardless of NPL status to eliminate or reduce the threat of a release. However, removal actions, such as installation of vapor intrusion mitigation systems, are not intended to address the source of the contamination.*
Nonetheless, the current Proposal would be easier to support if the proposed changes would in fact provide a reliable and consistent method for HRS scoring of vapor intrusion threats. By its very nature, however, vapor intrusion is directly at odds with the preliminary site assessment and investigation framework.	*EPA disagrees with the statement that vapor intrusion is directly at odds with the preliminary site assessment and investigation framework for the reasons explained in the responses to the remaining comments in this section (section II).*
Where SSI poses an immediate and acute health risk to residents and/or occupants of impacted buildings, the vapor intrusion must be promptly investigated and mitigated or remediated to protect those individuals. The drawn-out administrative process of NPL listing is poorly suited to address immediate concerns at sites where SSI presents a significant and imminent health threat, and EPA has other tools that are better suited to address this problem. As the United States Government Accountability Office ("GAO") pointed out in the very report EPA points to as justification for the current rulemaking, "the Superfund program conducts removal actions at both NPL and non-NPL sites that are usually short-term cleanups for sites that pose immediate threats to human health or the environment." In the recent OSWER VI Guidance, EPA acknowledges its existing ability to address SSI concerns using CERCLA removal actions as well as the RCRA corrective action program.	*The Superfund program, of which the remedial program is part, has rapid response abilities, and is therefore not "poorly suited" to address immediate concerns of SsI sites. If at any time during the preliminary assessment and site inspection process of collecting data for an evaluation of any HRS pathway or component, including the subsurface intrusion component, an acute threat to human health is identified, EPA can address the issue using Superfund removal program authority. The effectiveness of the response action to permanently address the threat posed by the release at the site will be considered in later steps of the Superfund program. While alternative programs are available to address some aspects of SsI sites, those programs may not always apply or provide a complete remedy.* *EPA's Superfund removal program has the ability to quickly respond to immediate threats to public health and the environment from the*

Comment	Response
Both of these programs allow for action to be taken far more quickly than could ever happen under the lengthy NPL listing process (not to mention the subsequent administrative negotiations, performance of a Remedial Investigation/Feasibility Study, development of a Remedial Action Plan, and remedy selection would take place if the site were ultimately listed on the NPL). EPA's cursory discussion of, and subsequent dismissal of, its existing authority to address SSI in the preamble to the Proposal is therefore unconvincing in the context of immediate health concerns posed by documented or likely SSI.	*release and a removal action can be implemented regardless of NPL status to eliminate or reduce the threat of a release. However, removal actions, such as installation of vapor intrusion mitigation systems, are not intended to address the source of the contamination. EPA has statutory limitations on the amount of funding and time for conducting removal actions. These limitations may restrict EPA's ability to rely on removal authority alone to fully address subsurface intrusion issues. Congress included in CERCLA Section 104 the Superfund remedial program, which can address releases which cannot be adequately responded to by the Superfund removal program.* *EPA agrees that in many cases there are alternative ways to address some SsI sites, however not all SsI sites can be addressed under non-Superfund authorities and programs. EPA typically only considers placement of sites on the NPL when other channels have been exhausted. EPA, in dialogue with other federal agencies, states and tribes, determines the most appropriate mechanism to address the threat posed by hazardous waste sites. EPA often defers sites to other EPA, state, tribal, or federal cleanup authorities, based on whether it is likely that the threat posed by the site will likely be adequately addressed. While some states/tribes have programs to address subsurface intrusion contamination, they often have limited authority and resources, and variable remediation criteria. The availability of the federal remedial authority and the more comprehensive site assessment program complements and strengthens these programs.* *Other EPA programs such as the Resource Conservation and Recovery Act (RCRA) and the Brownfields program have limited authority and ability to address all subsurface intrusion threats. The RCRA Corrective Action/Enforcement program is only applicable at sites currently subject to RCRA permitting or sites otherwise reachable by RCRA's enforcement activities. Furthermore, RCRA is a delegated program in many states and not all states recognize subsurface intrusion as a significant issue. RCRA sites with subsurface intrusion issues may not be addressable in all states. Also, governmental entities with site-specific Brownfields assessment and/or revolving loan fund cleanup may only use grant funds on the selected eligible property. While SsI sites may be eligible for Brownfields cleanup grants, site or property-specific limitations may not allow for permanent remediation. EPA's Superfund removal program has the ability to quickly respond to immediate threats to public health and the environment from the release and a removal action can be implemented regardless of NPL status to eliminate or reduce the threat of a release. However, removal actions, such as installation of vapor intrusion mitigation systems, are not intended to address the source of the contamination.* *Furthermore, EPA is modifying the HRS to comply with the statutory requirements in the 1986 Superfund Amendments and Reauthorization Act (SARA), which added section 105(c)(1) to CERCLA requiring EPA to amend the HRS "to assure to the maximum extent feasible, that the HRS accurately assess the relative degree of risk to human health and the environment posed by sites and facilities subject to review."* *Contamination due to subsurface intrusion is a known risk to human health and the ability to evaluate those risks is consistent with the CERCLA 105 mandate. When the 1990 HRS was undergoing revision, EPA did not include an evaluation of the risk posed by subsurface intrusion, as the state of the science would not have supported it at that time. As part of the development of this rule, EPA identified priority sites with significant contamination due to SsI that would not qualify for possible placement on the NPL using the 1990 HRS. With the addition of the SsI component to the HRS, sites can now be evaluated more comprehensively to consider the relative risk posed by a site.*
Where concern relates not to acute exposure but to the potential long-term impacts of possible SSI, a different problem exists: the limited window in which preliminary assessments and site inspections are conducted – typically two or three days – simply does not allow for reliable or meaningful data collection regarding SSI. This is true both in the context of vapor intrusion and that of groundwater intrusion. Both of these types of SSI are highly changeable, dependent on multiple constantly shifting factors including the weather and season. Attempting to assess the relative risk of a site based on data gathered during an extremely limited slice of time will lead to grossly inconsistent and unreliable results, likely to over-count risk in some situations and under- count it in others. While USWAG appreciates that the HRS scoring system is "designed to be a measure of relative risk among sites rather than absolute risk at an individual site," the unreliability of the data used to score the SSI component will undermine the program's goal of comparing sites to assess priorities for cleanup. As a general matter, the current preliminary assessment and site inspection process, which "does not rely on data that require extensive sampling or repeated sampling over a long period of time," is an appropriate way of assessing "relative risks among sites" arising from the existing groundwater, soil, air, and surface water pathways. It simply does not work in the context of the vapor intrusion or groundwater intrusion pathway—neither of which can be evaluated in a manner that is	*The commenter appears to misunderstand the purpose of the HRS and the role of subsurface component. An HRS evaluation is not a site-specific measure of risk. The purpose of an HRS evaluation is only to prioritize sites for further investigation to determine site specific risk. EPA considers, in most cases, the data collected during the preliminary assessment and site inspection to be sufficient for the purpose of an HRS evaluation of the SsI component. The abbreviated nature of these investigation steps (as compared to a remedial investigation, whose purpose is to determine site-specific risk)) does not negate the ability of an SsI component evaluation to measure the SsI threat within the overarching HRS framework, nor does it negate the utility of this component in assisting in site ranking any more than other HRS pathways; the other HRS pathways may be similarly complex at some sites, but this is not a reason to omit this screening-level evaluation of those threats.* *As recognized by the commenter, the HRS is a screening tool to gauge the relative risk posed by contamination at evaluated sites; an HRS evaluation is not a site-specific risk assessment. As noted in the conference report for the Superfund Amendments and Reauthorization Act of 1986 (SARA), the HRS need not meet the requirements of a risk assessment: "This standard does not, however, require the Hazard Ranking System to be equivalent to detailed risk assessments, quantitative or qualitative, such as might be performed as part of remedial actions…Neither the revised Hazard Ranking System required by this section nor any other provision of law or regulation requires the*

Comment	Response
consistent with EPA's goal "to carry out the initial studies expeditiously." USWAG is not suggesting that EPA extend the format or duration of preliminary site assessments or site inspections, or otherwise making the pre-CERCLA screening process more onerous or time- consuming. On the contrary, even if the SSI component is added to the HRS, "the fundamental purpose and structure of the HRS approach [should] not be changed." But threats posed by SSI are not of a nature that can be accurately evaluated in only a handful of days to allow for the assessment of relative risk at, and corresponding priority of, contaminated sites. EPA's attempts to address SSI concerns under the HRS framework is therefore misplaced. The inclusion of a vapor intrusion component in the HRS is further complicated by the complexity of vapor intrusion sampling and evaluation. While great strides have been made in this area in recent years, including EPA's recent issuance of the OSWER VI Guidance, vapor intrusion evaluation continues to be riddled with uncertainties due to a number of factors including physio-chemical and microbiological conditions and various physical characteristics of building foundations and structures. There simply is no "one-size-fits-all" approach to the evaluation of vapor intrusion.	*conduct of risk assessments at unlisted or listed facilities. (House Conference Report No. 99-962, 99th Cong. 2nd Sess. at 199-200, (1986)).*" *Given the variable nature of vapor intrusion it is possible additional sampling and collection of different types of samples beyond that of a typical site inspection performed for evaluating sites using any part of the HRS may be required at some sites for the HRS SsI component. This is also true for all pathway evaluations, and is dependent on the individual site characteristics. However, an SsI component evaluation is designed to be used with limited data; the sampling required to evaluate a site using the HRS SsI component is similar to that required for evaluating sites using other HRS pathways and components and is within the scope of a screening assessment. Furthermore, as is the case with the other HRS pathways, the level of effort required to evaluate a site already varies on a site-by-site basis depending on the size and extent of contamination at the site and the HRS pathways being evaluated. Therefore, it cannot be predicted with certainty that there will be an overall increase in level of effort for any particular site due to the HRS SsI Addition; similarly, it cannot be predicted that the evaluation of the SsI component based on the limited data from a preliminary assessment/site inspection will inherently lead to more high or low biased scoring than the other HRS pathways.* *The SsI component is no more a "one-size-fits-all" approach than any other HRS pathway or component. As with the other HRS pathways/components, it represents a reasonable measure of the relative risk posed by a site at the NPL listing stage of the Superfund process for the purpose of determining whether more in-depth investigation under Superfund is warranted. The complexities of determining the full extent of contamination as well as the fate and transport of contaminants noted by the commenter are site-specific aspects affecting risk that are addressed in a more thorough fashion in later steps of the Superfund process.*
EPA's proposed approach would drive the use of overly conservative benchmarks (e.g., EPA's Vapor Intrusion Screening Level ("VISL") calculator) that have little bearing to the actual protection of human health.	*Comments on the vapor intrusion screening levels are outside the scope and not relevant to this rulemaking. This rulemaking deals only with the addition of the HRS SsI component to the HRS. EPA notes, however, the HRS use of health based benchmarks is only to prioritize sites for further investigation, not to identify that unacceptable exposures are occurring or that remediation is needed. The HRS simply assigns a higher score to sites where, during a limited screening assessment, the measured concentrations are above HRS benchmarks. EPA is aware that a single sample may not represent actual exposure conditions.*
Throughout the preamble to the Proposal, EPA stresses the need to address SSI in a manner that is "comprehensive" and "consistent." This is a tall order under the best of circumstances, and a virtual impossibility when site investigations are undertaken during a single, condensed period of time based on limited data. As a result of the complexities and uncertainties associated with SSI, EPA's efforts to shoehorn vapor (and groundwater) intrusion assessment into the HRS screening process will have perverse results: the scoring of SSI factors is almost certain to be conducted in an overly-conservative and inconsistent manner nationwide, frustrating the HRS purpose of determining relative risk of contaminated sites and diverting limited resources away from sites that should be a higher priority.	*Similar to the other HRS pathways/components, the SsI component represents a reasonable measure of the relative risk amongst sites at the NPL listing stage of the Superfund process for the purpose of determining whether more in-depth investigation under Superfund is warranted. It cannot be predicted that the evaluation of the SsI component based on the limited data from a preliminary assessment/site inspection will inherently lead to more high or low biased scoring than the other HRS pathways; inclusion of the SsI component will therefore not result in a high bias of SsI-related site scores as compared to sites that do not involve SsI.* *Regarding the assertion that EPA is attempting to "shoehorn" the SsI component into the HRS, the SsI component has been designed to be added to the HRS in a manner consistent with the rest of the HRS, maintaining scoring balance with the other HRS pathways/components. The commenter has not offered any compelling reason to question this balance aside from claims that the SsI component scoring will somehow be biased in one direction or another, vaguely based on asserted additional variability affecting the component (but these claims are unsubstantiated as discussed). EPA also notes that because it is a measure of relative risk amongst sites, any bias imbedded in the SsI component will be the same for all sites, and therefore be accounted for in the relative site score comparisons.* *Regarding national consistency in scoring, because the placement of a site on the NPL is a federal rulemaking process, any proposed listing is subject to public notice and comment, and court challenge. If the public feels that EPA is inconsistently applying any part of the HRS, he or she can raise this issue at that time, and EPA must respond accordingly.*
III. Comments Regarding Proposed Approach to Scoring of SSI Component	
As explained above, EPA has failed to demonstrate the necessity, propriety, or value of adding an SSI component to the HRS. If the Agency nonetheless decides to proceed with this rulemaking, USWAG offers the following comments on EPA's proposed approach to scoring of that component.	*EPA is modifying the HRS to comply with the statutory requirements in the 1986 Superfund Amendments and Reauthorization Act (SARA), which added section 105(c)(1) to CERCLA requiring EPA to amend the HRS "to assure to the maximum extent feasible, that the HRS accurately assess the relative degree of risk to human health and the environment posed by sites and facilities subject to review."* *Contamination due to subsurface intrusion is a known risk to human health and the ability to evaluate those risks is consistent with the*

Comment	Response
	CERCLA 105 mandate. When the 1990 HRS was undergoing revision, EPA did not include an evaluation of the risk posed by subsurface intrusion, as the state of the science would not have supported it at that time. As part of the development of this rule, EPA identified priority sites with significant contamination due to SsI that would not qualify for possible placement on the NPL using the 1990 HRS. With the addition of the SsI component to the HRS, sites can now be evaluated more comprehensively to consider the relative risk posed by a site.
A. <u>Consideration of Future Subsurface Contaminant Migration</u> USWAG agrees with EPA's decision "not to include the consideration of future subsurface contaminant migration in the proposed [SSI] component." The Agency is correct that the ability of "present science to accurately project hazardous substance migration through both the [groundwater] and the unsaturated zone is limited." As EPA acknowledges in the preamble to the Proposal: > The ability of a site assessor to accurately evaluate the potential future migration of subsurface hazardous substances would rely heavily on the ability to gather site-specific data in all areas of future migration in the relatively short time period and with minimal resources available when data collection for an HRS evaluation is performed (*i.e.*, during the site inspection). EPA's review of existing models indicate that in most instances, to obtain acceptable projections, extensive site-specific data collection efforts and often multiple rounds of site inspections are required to develop an accurate model for projecting the future extent of vapor migration … As discussed in the [Technical Support Document to the Proposal], the ' … misapplication of a model or the use of incomplete data would, of course, result in less accuracy … [and] a very conservative model may also increase the frequency with which sites that do not pose significant risks are placed on the NPL. USWAG concurs that allowing for speculation regarding potential future subsurface contaminant migration in HRS scoring is inappropriate. As the Agency states in the preamble, "[t]he possibility of placing sites on the NPL based on speculative projections with no demonstrated risk of actual exposure is too significant." As explained above *[see section III]*, USWAG believes that concerns regarding speculation and potential over- (or under-)counting of SSI risks render the HRS an inappropriate vehicle for any consideration of SSI. If EPA does move forward with the inclusion of an SSI component in the HRS scoring process, however, the Agency's charge under CERCLA to identify and prioritize those sites that pose the greatest risk to health or the environment dictates that any SSI component of the HRS must exclude consideration of future migration.	*EPA has added the SsI component to the HRS. The component does not include evaluation of future lateral migration of contamination in the subsurface.* *Regarding the commenter's statement that the HRS is an inappropriate vehicle for consideration of SsI, EPA disagrees. See responses provided above (section II).*
B. <u>Application to Sites With "Regularly Occupied" Structures; Areas of Subsurface Intrusion</u> As a general matter, USWAG agrees with EPA's proposed approach that would limit application of SSI scoring to sites with "regularly occupied structures." The concerns which this rulemaking is intended to address simply do not exist if individuals are not, as a practical matter, exposed to vapor intrusion above any de minimis levels. In order to promote consistent application of the scoring system (if a final rule is promulgated), EPA should clarify the meaning of "regularly occupied" in the rule itself. If EPA does proceed with this rulemaking, USWAG also offers general support for the bifurcation of areas of subsurface intrusion into (1) "areas of observed exposure" ("AOE") and (2) "areas of subsurface contamination" ("ASC"). USWAG agrees that only regularly occupied subunits with an observed exposure (and levels below such subunits) should be included within an AOE. USWAG also agrees that it is appropriate to count within an ASC for HRS scoring purposes only those units on the lowest level. USWAG further concurs that it is appropriate to assign less weight to populations in those areas where SSI is a mere possibility than to populations in areas where SSI has actually been documented.	*EPA has added the SsI component to the HRS and acknowledges the commenter's concurrence on EPA's approach for applying the SsI component. The component includes only evaluations of areas with demonstrated subsurface intrusion into regularly occupied structures and areas of demonstrated subsurface contamination where intrusion into regularly occupied structures is likely to be occurring. Lesser weight is given to populations in areas where subsurface intrusion hasn't been demonstrated.* *Regarding clarification of the meaning of "regularly occupied structure", EPA considers this an appropriate topic for any future guidance because of the possible variation in site-specific exposure scenarios.*

Comment	Response
C. <u>Weighting of Population Factor (Residents vs. Workers)</u> USWAG agrees with EPA's approach to assign less weight to workers based on the relatively limited time workers would be expected to spend in a workplace. EPA should also consider further distinguishing (i.e., summing and dividing by a factor greater than three (or six, for part-time workers)) workers who are expected to spend the majority of their time in an area of the workplace that is not impacted by SSI (for example, an office worker with a cubicle on the upper floors of a multi-story building). EPA should also consider assigning less weight to other (non-worker, non-resident) individuals (for example, part-time college students where a school building is potentially impacted by SSI) that spend only a small fraction of their time in the occupied structure.	*EPA has added the SsI component to the HRS and acknowledges the commenter's concurrence with EPA's approach to assigning less weight to workers. EPA has not changed the weighting of workers from the proposed rule, nor is it changing the weighting assigned to other individuals that may only be part time, or spend a fraction of their time in other occupied structures. EPA does not consider it likely that the information necessary to do so, even if available or could be estimated, could be obtained during a limited site assessment at all sites being evaluated. However, EPA considers the identification of workers eligible for evaluation using the SsI component to be an appropriate topic for any future guidance documentation developed to support implementation of the SsI component.*
D. <u>Differences in Building Types and Sizes</u> USWAG appreciates EPA's request for comment regarding how a final rule should "take into account the differences in dilution and air exchange rates in large industrial buildings as compared to smaller residential and commercial structures when calculating the hazardous waste quantity" for the proposed SSI component. These factors have a direct bearing on risk presented by SSI, and failure to adequately account for these differences will lead to overestimation of risk and a correspondingly skewed prioritization of sites. The building air exchange rate ("AER") expressed as air changes per hour ("ACH") is a measure of the amount of air entering a building at a particular point in time and depends on building energy efficiency, wind speed, and direction and operation of a mechanical ventilation system ("HVAC")—parameters which are generally unavailable during an initial assessment. Moreover, there is considerable variability in HVAC system performance owing to age and condition of the system and equipment, and the to the amount of outside air required to achieve indoor air temperature set points and/or ventilation "comfort" parameters such as maximum levels of carbon dioxide. However, since larger commercial buildings typically have AERs approximately twice those of smaller buildings, a factor of two would seem to provide a conservative adjustment when calculating the hazardous waste quantity. For larger manufacturing buildings, and AER of five (5) is not uncommon, but is dependent on the nature of the process. Thus, a sliding scale based on building size and general use may account for the differences in contaminant clearance.	*EPA agrees that there may be differences in dilution and air exchange rates between large and small structures. However, based on responses to EPA's question, and EPA's knowledge of the variability in site-specific situations as it pertains to vapor intrusion, it is not possible to obtain the level of information necessary to account for these difference during a time-limited screening assessment at most sites. However, if the public supplies the necessary data regarding air exchange rates, that information can be used to estimate the actual mass of hazardous substances entering into a structure (a Tier A evaluation), and that data will be used in the HRS site evaluation in assigning a hazardous waste quantity factor value.*
E. <u>Resources</u> USWAG agrees that resources (e.g., libraries, churches, tribal facilities) should only be counted for the SSI component if they are regularly occupied. USWAG reiterates that EPA should clarify the meaning of "regularly occupied." In addition, EPA should clarify that a resource should only be counted to the extent the population by which it is regularly occupied is not already being counted under the population factor. This is consistent with EPA's statement that resources are intended to "represent uses of a contaminated medium or area where exposures occur and are not covered by the other identified targets." This concept is suggested in the preamble to the Proposal, in which EPA states that resources include "regularly occupied structures that are located within a defined AOE or ASC … and in which populations, not including those already counted as exposed individuals, may be exposed to contamination" due to SSI. However, to avoid confusion and potential over-scoring of the SSI component, EPA should include this clarification in the actual regulatory text.	*EPA has added the SsI component to the HRS and acknowledges the commenter's concurrence with EPA's approach considering regularly occupied resources eligible for evaluation. It included consideration of resources in assigning an HRS score. Regarding the concern that resources should only be counted to the extent the population by which it is regularly occupied is not already being counted under the population factor, the commenter appears to misunderstand the purpose of the evaluation of resources. Resources represent structures at which exposures can occur that are not accounted for in other parts of the HRS evaluation (e.g., the population would not be considered exposed individuals associated with the resource). The resources value is assigned if one or more such structures are present, and not based on the size of the population using the resource. If the same population is exposed elsewhere, or is likely to be exposed elsewhere, it is not a consideration in assigning the resources value to the site as that would reflect a different exposure location.* *Regarding clarification of the meaning of "regularly occupied structure", EPA considers this an appropriate topic for any future guidance because of the possible variation in site-specific exposure scenarios*
F. <u>Total Score for Soil Exposure Pathway</u> USWAG concurs that the maximum total score for the proposed soil exposure pathway (soil exposure component plus SSI component) should be limited at 100. This is consistent with the current HRS framework for the existing pathways, and would help mitigate the potential for over-weighting of the direct exposure pathway represented by the combined soil exposure and SSI components.	*EPA has added the SsI component to the HRS and acknowledges the commenter's concurrence with EPA's approach limiting the maximum score of the Soil Exposure and Subsurface Intrusion pathway to 100, as for all HRS pathways.*

Comment	Response
IV. Any Final Rule Should Not Impact Sites Already Evaluated Under HRS USWAG agrees that any final rule promulgated to amend the HRS should have no impact on sites that have already been evaluated using the HRS, regardless of whether those sites scored below 28.5 and are therefore not eligible for NPL inclusion, are currently being considered for listing on the NPL, or have already been listed on the NPL. Revisiting sites that have already been evaluated would complicate current prioritization decisions, disrupt EPA's current listing of sites, and divert resources necessary to conduct pre-remedial screening at additional sites going forward. This would prove counterproductive in light of EPA's goals for the current rulemaking.	*In response to the commenter's concern regarding whether EPA intends to "revisit" sites that did not previously score high enough for NPL listing, discussion of re-scoring of sites within the SsI component is not a comment relevant to this rulemaking. The SsI component is a method for evaluating sites with possible SsI issues for placement on the NPL, not for establishing EPA policy as it applies to selecting sites for scoring. Promulgation of this HRS SsI Addition has no impact on EPA's procedures for identifying sites for evaluation or re-evaluation using the HRS.* *However, to clarify EPA's current policy regarding re-evaluation of sites previously assessed using the HRS that did not qualify for the NPL, EPA does not plan to initiate a comprehensive program to re-evaluate non-NPL sites to determine whether they would now be eligible for placement on the NPL. However, sites not on the NPL may need to be re-evaluated for the NPL using the amended HRS in the future if new information, or consideration of the SsI threat or any other threat, indicates the overall threat posed by the release at the site may be unacceptable. Conditions at sites may change over time and new information or changes in science could identify the need for further investigation at a site and perhaps the need for response action. Just as for other situations when new information becomes available for any site, if EPA, a state, tribe or other federal agency determines it is appropriate to re-evaluate a site, or change its priority for further action, it can do so using its existing or future budget resources. EPA works in consultation with the lead agency at a site, be it state, tribal, or federal, to determine the appropriate steps to re-evaluate such sites.*
V. Consideration of Alternative Approach Tailored to "Tier 1"-Type Sites	
EPA explains in the preamble to the Proposal that the proposed vapor intrusion component is based on the Agency's review of 1,073 sites "that may or may not qualify for the NPL but are suspected of having vapor intrusion issues." The significance of this figure is questionable, since implicit in EPA's statement is the fact that these sites may already qualify for NPL listing based on the current HRS scoring structure—in which case the proposed change would not be necessary for those sites to be captured by the CERCLA screening and remediation process or for vapor intrusion to be adequately addressed. Moreover, EPA acknowledges that, of these 1,073 sites, only eleven—just one percent—actually have documented exposure "of a sufficient number of targets and sufficient other HRS-required evaluation factors to suggest the site may qualify for the NPL." These data are shaky at best, and fail to demonstrate the need for a rulemaking that would revamp the HRS scoring process, impose significant site inspection costs at sites nationwide, and undermine the integrity of the site prioritization process.	*To support the rulemaking, EPA conducted a screening-level assessment of sites with identified subsurface intrusion threats. As a first step in collecting the list of sites potentially affected by the final rule, EPA consulted with site assessment experts that work in Superfund to identify potential site candidates. EPA also reached out to state counterparts, in particular to state programs that were known to have taken a more thorough investigation of the subsurface intrusion pathway at sites. Through this process, EPA identified approximately 1,073 sites that either had shallow ground water contamination, vapor producing chemicals, nearby populations (Tiers 3 or 4) or sites with sampling data demonstrating a vapor intrusion issue (Tier 1 and 2). These sites are not currently on the NPL, and all have a potential or identified SsI threat. Within the group of sites potentially affected by the HRS SsI Addition, EPA defined four categories:* • *Tier 4: Sites identified as having a suspected SsI threat based on EPA's Superfund database and Agency for Toxic Substances and Disease Registry keyword searches, as well as EPA or state self-identification, but for which no sampling data were obtained;* • *Tier 3: Sites identified as having characteristics or evidence that indicate SsI may have occurred or will occur;* • *Tier 2: Sites identified as having an SsI threat documented by subslab, crawl space, or indoor air samples, but insufficient HRS-required evaluation factors to qualify for the NPL; and* • *Tier 1: Sites identified as having an SsI threat with documented actual exposure of a sufficient number of targets with enough other HRS-required evaluation factors to suggest the site may qualify for the NPL.* *EPA selected the Tier 1 sites for use in testing the SsI component evaluation process. The Test Sites were not randomly chosen, but instead were specifically chosen because they have a documented subsurface intrusion threat at the sites and sufficient available data to test all parts of the SsI component. Appendix B of the Technical Support Document (TSD) for this final rulemaking provides a summary of these scoring evaluations.* *Furthermore, EPA is modifying the HRS to comply with the statutory requirements in the 1986 Superfund Amendments and Reauthorization Act (SARA), which added section 105(c)(1) to CERCLA requiring EPA to amend the HRS "to assure to the maximum extent feasible, that the HRS accurately assess the relative degree of risk to human health and the environment posed by sites and facilities subject to review."* *Contamination due to subsurface intrusion is a known risk to human health and the ability to evaluate those risks is consistent with the CERCLA 105 mandate. When the 1990 HRS was undergoing revision, EPA did not include an evaluation of the risk posed by subsurface intrusion, as the state of the science would not have supported it at that time. As part of the development of this rule, EPA identified priority sites with significant contamination due to SsI that would not qualify for possible placement on the NPL using the 1990 HRS. With the*

Comment	Response
	addition of the SsI component to the HRS, sites can now be evaluated more comprehensively to consider the relative risk posed by a site.
If EPA nonetheless feels that HRS amendment is necessary to address its vapor intrusion concerns, a more targeted approach seems appropriate in light of the relatively small number of sites at which vapor intrusion is more than just a theoretical concern. A review of the eleven sites designated as "Tier 1," where documented exposure exists, reveals that these sites share many common characteristics and generally follow a similar profile in terms of former site use and contamination profile. EPA's limited resources could be put to more efficient use by crafting a limited, threshold-level inquiry to screen out sites that are unlikely, from a practical perspective, to present significant vapor intrusion risks. This screening step could help identify sites falling within the Tier 1 profile that, as demonstrated by EPA's Proposal and the site inventory and discussion in Appendices A and D of the Technical Support Document, present the greatest vapor intrusion risk. Such an approach could be tailored as a high-level, very simple screening process that would, at minimal cost and in minimal time, essentially "screen out" sites that are unlikely to have a significant vapor intrusion issue. Such "screened out" sites might include, for example, sites that may have regularly occupied structures but where groundwater or soil are impacted only by substances with low volatility. Under this framework, any site for which the SSI component would be assessed and scored using EPA's proposed approach would instead first go through a high-level screening process that could prove effective with only two yes-or-no questions aimed at identifying (1) whether groundwater at the site is impacted with highly volatile chemicals, and if so (2) whether regularly occupied structures are located above that contaminated groundwater plume. If the answer to either the first or second question is "no," the site should be assigned a score of zero for the SSI component and should then be assessed and scored for the soil exposure component and the air, surface water and groundwater migration pathways, as applicable. If the answer to both questions is "yes," the site would then go through the full SSI component scoring as proposed by EPA (subject to USWAG's comments on specific aspects of the Proposal, as set forth in section III of these comments). This remains a conservative approach as it would "screen in" many sites that will ultimately receive low (or potentially zero) SSI component scores once they are scored under EPA's proposed system, due to factors such as structural characteristics limiting or precluding vapor intrusion, low hazardous waste quantity or significant depth to contamination. There is, of course, also the possibility that a site could "screen out" and later be found to present vapor intrusion concerns, particularly if new information is identified at further stages of the site investigation and remediation process. However, this issue would likely arise under EPA's proposed approach in any case, as it is simply a function of the "snapshot" nature of the preliminary site assessment and site investigation process under the existing HRS, which is characterized by data limitations and time constraints. Moreover, any potential vapor intrusion concerns at sites that "screened out" could be addressed during the remediation process as they typically are under the existing HRS. The addition of a screening step to the proposed SSI component rule would avoid the unnecessary costs, confusion and delay associated with implementing the complicated SSI assessment and scoring at the vast majority of sites across the country. Limiting the full SSI component scoring to those sites that are most likely to present a significant vapor intrusion risk would be in line with EPA's goal of "assessing the worst sites first" and would prove a more efficient use of limited resources needed to identify those sites that should be assigned the greatest clean-up priority. This would streamline (or at least, not unnecessarily complicate or delay) the site inspection process at sites that are, from a practical perspective, very unlikely to present a significant risk from vapor intrusion. The work that EPA has already done in connection with the current Proposal, including Appendices A and D to the Proposal's Technical Support Document, would prove a useful starting point in crafting such an approach.	*The process that the commenter is suggesting is already performed in an earlier phase of the site assessment process, prior to an HRS evaluation. The commenter's suggestion of a preliminary screening process similar to one used to organize the 1,073 sites into several tiers in lieu of the SsI component methodology, this type of screening process is similar to that typically performed by EPA after a preliminary assessment is conducted, and is not an equivalent screening process to that performed during an HRS evaluation. It is EPA's experience that this level of screening would not effectively identify the priority sites to the maximum extent feasible as required by CERCLA 105(a)(8)(a). EPA notes, however, that it may incorporate an SsI screening process into the preliminary assessment process that will serve to reduce the number of sites that will be evaluated using the SsI component.* *Also, the commenter's proposed screening process would only consider the threat posed by SsI in the site selection process, as it would not incorporate consideration of threats posed via other pathways in making the NPL decision. Without a similar structure and concept to incorporate the other pathways of the HRS, it would not be possible to combine pathway scores to obtain an overall site score in a manner which weighted all threats equivalently.*

Comment	Response
VI. Public Engagement Regarding Additional Guidance and Support Documents EPA's Proposal is of such complexity that the need for additional guidance regarding application and implementation of any final rule is foreseeable. Should EPA proceed with a final rule and undertake the development of additional technical support documents and/or guidance documents to facilitate implementation of such final rule, USWAG encourages EPA to make those guidance documents available in draft form for public review and comment and to defer promulgation of any final rule until after the public has been provided an opportunity to review and comment on the draft technical and guidance materials.	*EPA does not agree that promulgation of the HRS SsI Addition needs to be delayed until guidance is developed and vetted via public notice and comment. Guidance on implementation of the HRS SsI Addition is not necessary for evaluating the SsI component, which is a scoring mechanism and does not identify procedures for such topics as data collection or application to every site. EPA considers discussion of procedures to be used in an HRS evaluation to be appropriate discussion for guidance, and that guidance will be developed as EPA gains experience in implementation of this rule. EPA notes that the VI guidance document contains methods for data collection for VI investigations. EPA also notes that to delay addressing sites that may pose a significant human health risk until all guidance documents have been developed would not be consistent with EPA's mandate to protect human health. EPA will use appropriate procedures, including solicitation of public input, as appropriate.*