

Lead Rule Policy Dialogue

Interview Findings

A report to the Convening Committee and the
Georgia Environmental Protection Division

*prepared by the
Carl Vinson Institute of Government
University of Georgia*

September 2000

CONTENTS

INTRODUCTION	1
INTERVIEW RESULTS: Key Issues and Concerns	1
Industry	3
Consultants	8
State agency	13
Environmental advocacy groups	18
Health sector	22
Local government	23
ANALYSIS OF KEY ISSUES AND CONCERNS	25
INTERVIEW RESULTS: Expectations and preferences for consensus-building	27
Product	27
Participants	28
Barriers to success	29
Conditions to encourage participation in a consensus-building process	30
RECOMMENDATIONS FOR A SUBSEQUENT CONSENSUS-BUILDING PROCESS	32
APPENDIX A: Interview protocol	37

INTRODUCTION

This report summarizes the findings from a series of interviews conducted to elaborate current issues concerning the lead rule (Rules for Hazardous Site Response, Chapter 391-3-19) and to explore the potential for consensus-building on further revision of HSRA rules pertaining to lead clean-up. Interviews were conducted by faculty with the University of Georgia's Carl Vinson Institute of Government, operating under contract with the Georgia Environmental Protection Division but serving all stakeholders as a neutral party.

The interview process was guided by a convening committee with representatives from EPD, regulated industry, local government, consulting engineers, environmental advocacy groups, and the environmental public health sector. Interview participants were identified through an "snowball" referral process that began with nominations from convening committee members. Thirty-five interviews were conducted and some respondents submitted written information, resulting in a total of 39 contributors from the six sectors:

- Industry (10 contributors)
- Consultants (engineers, toxicologists, etc.; 9 contributors)
- State agencies (EPD and DHR; 7 contributors)
- Environmental advocacy groups (7 contributors)
- Public and environmental health (3 contributors)
- Local government (3 contributors)

Interviews were semi-structured, following a protocol that included groups of open-ended questions (see Appendix A). Each interview had two major sections. The first addressed key issues on management of lead-contaminated sites and Georgia regulations as they currently stand. The second section explored respondents' expectations and preferences for a subsequent consensus-building process addressing further revisions to the lead rule.

The key issues and concerns highlighted by respondents are outlined in the first section of this report. The second section presents the contractor's general analysis of this portion of the interview results. The third section of the report provides an overview of the interview results that address expectations and preferences for a subsequent consensus-building process. The final section, then, presents the contractor's recommendations for consensus-building on further revisions of HSRA rules regarding lead-contaminated sites.

INTERVIEW RESULTS: KEY ISSUES AND CONCERNS

Issues and concerns highlighted by interview respondents fell in four major categories (see Table 1):

- General concerns regarding lead in the environment
- Management of lead-contaminated sites
- Administrative and procedural issues
- Sector-specific issues

Nearly 70% of the comments addressed the second category, specific issues in management of lead-contaminated sites. The other categories, however, include issues highlighted as significant by subsets of respondents and define the context for discussion of Georgia's regulations for lead-contaminated sites.

Table 1. Key issues and concerns

General concerns re: lead in the environment

- State of knowledge on lead in the environment and human health impacts
- Soil and groundwater as exposure pathways
- The communities impacted by hazardous sites

Management of lead-contaminated sites

- Assessment and notification
- Site characterization: Background levels and delineation to background
- Clean-up levels (risk reduction standards)
 - Site-specific vs. default standards
 - Groundwater considerations
 - Comparing Georgia's approach to EPA and other states
 - Additional limitations in model application
 - Average values versus bright line thresholds
 - Point of exposure
 - Remediation vs. attenuation and control of exposure
 - Institutional controls and future use
 - Model factors written into rule rather than guidance
 - Surface-subsurface differences
 - Financial impacts

Administrative and procedural issues

- Consistency in treatment of different compounds under HSRA
- Regulatory flexibility and discretion
- Procedural and programmatic inconsistencies
- Risk perception and communication

Sector-specific issues

- EPD decision making and "public trust"
- Infrastructure issues

It should be noted that, while this project focused primarily on the lead rule, respondents raised a number of issues that have broader implications. That is, although the issues manifest themselves in the context of lead-contaminated sites, they may also have implications for other activities under the Hazardous Site Response Act or for broader state policy. It should also be noted that many of the issues identified by respondents are interrelated. In this report, respondents' concerns are broken into discrete topics for clarity, but key connections across the issues should be kept in mind.

Representative comments from each sector on these issues are summarized below. These comments are not necessarily direct quotes but are paraphrases that provide an overview, reflecting without judgement the array of opinions and concerns highlighted by the respondents from each sector. The overview is designed as a summary of comments made by respondents and is intended to serve as background information for any subsequent facilitated process that builds on the results of these interviews.

Industry

General concerns re: lead in the environment

State of knowledge on lead in the environment and human health impacts

- Lead is not as great a threat as it used to be. The levels of lead in the environment have declined.
- The goal is to be protective of human health and the environment — a moving target as knowledge changes.

Soil and groundwater as exposure pathways

- I know of no instances where environmental exposure to lead in soil or groundwater has been shown to a source of elevated blood levels. It could be occurring without us finding it, but exposure to lead in soil has not led to high blood levels in the proportion expected. And, EPA has discounted groundwater as an exposure pathway. The threat may be over-stated.
- There's not thought to be a lot of blood lead elevation caused by soil; it's accepted federally that lead in soil is not a critical problem.

Management of lead-contaminated sites

Assessment and notification

- Note the 400 mg/kg *notification* concentration versus the 75 mg/kg *clean-up* concentration for residential sites. If you can clean up to 200 mg/kg within 30 days, you don't have to notify. Bottom line is that, if you can be nimble with small sites, then you can keep from getting on the list and avoid the more stringent requirements.

Site characterization: Background levels and delineation to background

- Delineation to background, or the level present in the environment from sources other than the site, is written into rule with the intent of figuring out what the site is, but without a clear understanding that there is lead there from other sources. Problem is that it's expensive and you may not be able to accomplish, particularly given leaded gas.
- Should be able to map the impacted areas comprehensively, not constituent by constituent, particularly for sites where lead and site-specific contaminants go together and then, at some point, the trend lines stop moving together.
- There's a total disconnect between delineation to background and figuring out the risk reduction standard. On some sites, have agreed on risk reduction standards before we could agree on delineation to background.

Clean-up levels: Site-specific vs. default standards

- The biggest issue is determining a clean-up standard that is protective of human health and the environment. It is not uncommon to have a site in Georgia and similar sites in other states and have very different set of obligations and clean-up standards.

- Need to be site specific to calculate the risk from each site, and not take a cookie cutter, most restrictive approach. That may be the safest, eliminating controversy but is it really a fair thing to do?
- Sites should be cleaned-up to the appropriate levels. I don't believe we'll ever achieve pristine or background at some sites. There's too much economic impact and too much of a trade off with what the public wants.

Clean -up levels: Groundwater considerations

- EPD's approach says you have to assume that groundwater is a source of drinking water. They have a model that has the ability to take a number of parameters into account. They have chosen to fix some of the parameters by making this groundwater assumption which, in turn, limits the model's ability to give you a scientific answer.
- Lead is the only substance under HSRA where the soil and groundwater numbers are tied together. At all types of sites, whether residential or non-residential properties, groundwater has to meet a standard of 15 ppb. This is over the top for non-residential property or where groundwater is not actually being consumed. And, then you have to limit lead in soil to level that will not leach at levels higher than 15 ppb, because of the policy presumption that all groundwater is drinking water.
- The assumption that all groundwater is potential drinking water is another part of EPD's restrictive approach. Most municipalities prohibit withdrawals in their service areas, although I realize that ordinances can be changed.
- On groundwater, we have to be able to say either it's not potable or it is potable but not being used and can't be used unless something is done to clean it up — through institutional controls. Either one, we could work with. The second is offered because of the resistance to an aquifer classification system.
- The amendments made last year are largely meaningless, because the models to calculate concentration in soil are over-ridden by EPD's requirement that you take groundwater into consideration. The presumption that all groundwater is drinking water drives the calculation of soil concentration.
- The regulators will say that the best thing for the people of Georgia is to model groundwater concentration right under the source because all groundwater is potentially drinking water. And, I think you can work on that basis If you could consider some exclusion zones.
- A key issue is the presumption that a person on the site will get all of their drinking water from the lead-contaminated groundwater, regardless of where the water is really coming from. If they are drinking city water, why do I have to assume they are drinking groundwater? The number you would really want to put in the model is what's actually in the drinking water.
- They could even call it drinking water if we could say in the model and the assessment that no one is currently drinking it. Where that's true, don't make the model assume that they are drinking it.
- We do not have the technical methods to remove all lead in groundwater even if we could spend unlimited money. So, the regulated community is required to meet a groundwater standard that cannot be met even with all the money available. In certain situations, the cost and technical challenge should be grounds for at least on occasion saying another groundwater standard should apply.

Clean-up levels: Comparing Georgia's approach to EPA and other states

- Overall, Georgia is considerably more stringent than federal regulations and those of other states. I have to believe that at least some of these states are dealing with lead in a cost-effective way. I respect EPD's desire to be a leader, but we may be spending too much to protect human health and the environment in Georgia.
- Most states rely on EPA because of the resources and time they put in to developing models and so on. EPD has tried to find a safe place in public perception, trying to make sure they can't be accused of allowing anything in there that could hurt anyone at any time. Whereas EPA has fine-tuned the ability to say yes, there's something there but the risk of injury is so low that it doesn't require action.
- We have never had EPD look at the science and then say, ok, here it is but we're not going there because of whatever the policy considerations are.
- California, for example, is very protective environmentally and they set 400 ppm for soil in play areas and 1000 ppm elsewhere for residential sites. I don't understand why a state would want to carve out such an extreme position with no scientific basis and not recognize that surrounding states are going another way.
- Discrepancies between state and federal levels for non-residential sites are a key issue. With the federal approach, you can get theoretically get numbers up to 800-1000 for non-residential sites. For the state's Type IV, you can theoretically get similar numbers, but it doesn't happen in practice.
- The regulations limit use of the models to soil only. In other states and in the federal programs, you can use a model to calculate the groundwater clean-up number for a specific site. Here, it's the same number for Types I through IV.

Clean-up levels: Additional limitations in model application

- EPD did accept the IEUBK, but they don't accept all the factors, they went with the more restrictive factors. The core issue: there's a good set of science out there on lead; a tremendous amount of money has been spent (federal and industry). So, use it.
- The risk people at the state have to approve the variables you select. And, they are not as accepting of site-specific or regional values as the federal people. The state people keep pushing the parameters lower or pushing the default down.
- Sometimes they agree with the model until they see the end result. Then they say don't know why it's wrong but this is just too high for me. Their guidance provides range of values and they say you picked one that's too high here, once they see a result that doesn't sit well with them.
- Lead models are designed to allow some flexibility for meeting risk-reduction standards under HSRA. But, they are compromised, flexibility is almost eliminated in the way EPD applies them.
- Another example of the state's overly-protective approach: not recognizing filtered samples, a way to eliminate false detection of lead in groundwater samples. The Water Protection Branch now has rules to allow filtered samples for metal toxicity.

- The way the model handles background levels: models are built on a baseline that includes the mean blood concentration that express whatever lead someone is exposed to as “background,” though we don’t know what the background is. But, in the Adult Lead Model, if no lead is detected, EPD requires that you add half of the detection limit. You’re adding lead in when there’s already a baseline in the model.

Clean-up levels: Average values versus bright line thresholds

- When you use the models that EPD provides to calculate clean-up concentrations, you get average concentrations, not bright-line concentrations. But, EPD tends to treat them as bright line numbers rather than a mean for the site, a mean that has a certain confidence level.
- Take residential sources. EPA and HUD guidelines specify composite dripline samples, comparable to using an average value. But, rather than averaging, HSRA specifies 75 ppm as a bright line that’s violated if any single measure exceeds it.
- The models that calculate clean-up levels were built on averages; a bright line approach is a significant departure from the science that underlies the models. The Adult Lead Model is a central tendency model. You are instructed to use average numbers until the end of the calculation, when you go to the 95 percentile. But, HSRA is based on extreme values. This approach results in a margin of safety that’s 6, 8, 10X.
- We have proposed a clean-up level to the state. But, the issue for us is, is that a point number or an average for an area of concern? It should be the latter or you should be able to use a multiplier.

Clean-up levels: Point of exposure

- If I know that I have control of a site, why assume that someone’s going to drill a well in the middle of the property? Should assume that the point of exposure will be the 1~ point people would actually have access, for example, just outside the fence.
- The assumption is that any where you can install a well is a potential point of exposure, even if there is no well there now and no intention to ever put one there. Yes, land uses can change but there are other ways of addressing that, such as deed restrictions.
- Need to allow for fate and transport modeling in a way that takes attenuation and dilution into account. The risk to human health and environment is at the closest point that a well is possible, not at the point closest to the source under the soil. That’s the way the federal program works, and you can deal with that even for drinking water aquifers, if you consider some exclusion zones.
- Probably the biggest challenge here for the regulators is criteria for determining point of exposure. But, there’s a good argument for institutional controls.

Clean-up levels: Remediation vs. attenuation and control of exposure

- HSRA rules overall are removal-oriented: presume exposure and then have complete removal as the primary thrust, although there are some exceptions to that. But, the key issue is prevention of exposure to lead-contaminated media: remove, decontaminate or leave in a way that doesn’t represent an exposure threat. Interrupting exposure pathways may be the most efficient way to decrease exposure.

Clean-up levels: Institutional controls and future use

- There's difference between a fenced, industrial facility and a day care center with kids playing on soil. We don't know what will happen in 30 years but as long as we have control over a site --- that should affect our clean-up levels. And if we sell, any contamination will be a factor in the sale.
- Institutional controls, including deed notices, on-going property ownership and provision of public water with local ordinances prohibiting wells, can make sure wells are not put there.
- Deed restrictions can be part of a compliance package to ensure that a drinking water well will never be installed on this property, here in the middle of an industrial facility.
- Look at lead in housing: over the years, have found that preventing exposure by barriers and treatment does a better job in decreasing exposure than removing lead.

Clean-up levels: Model factors written into rule rather than guidance

- In 1999, there was some discussion of not putting the models in the rule, but referencing EPA use of EPA's current model. Now, if the models become obsolete, you have to change the rule. But, that was something EPA was just not comfortable with.
- I firmly believe that the values should not be in the rule. That would allow flexibility when EPA changes databases. If the numbers are in guidance, they could change as EPA changes.

Clean-up levels: Surface-subsurface differences

- The surface has potential impacts from vehicles and other industrial processes and should perhaps be treated differently than subsurface contamination.

Clean-up levels: Financial impacts

- Balancing a health-protective level against prohibitive costs is an issue. Cleaning soils is very expensive, and the groundwater assumptions and delineation to background drive spending money that could be better spent elsewhere.
- Federally, they now recognize that lead in soil is not a critical problem and that clean-up can rob money from the programs that target the real problems: interior paint and dust.

Administrative and procedural issues

Consistency in treatment of different compounds under HSRA

- Hazardous waste management pursues a kind of precedent protection: we won't do it that way because we don't do it that way for other substances.

Regulatory flexibility and discretion

- The frustration is that the rules already give the Director discretion in this area but he has never used it. So, you could say that nothing needs to be fixed if the Director would ever use that discretion.

Procedural and programmatic inconsistencies

- Need more consistency between HSRA and other programs. You can investigate and clean a site under RCRA and then have EPD take the position that other HSRA obligations apply.
- Similarly, you can be given an okay under the UST program but then be revisited under HSRA. If the standard is protective of human health and the environment under RCRA, then it should also be under HSRA. If not, then you're using the wrong standard.
- There is a disconnect between the site managers and the higher ups. You get something from the higher ups and then submit documents based on that information or meeting, and then you get a letter back from the site manager saying that you can't do that.

Consultants

General concerns re: lead in the environment

State of knowledge on lead in the environment and human health impacts

- I think the state of knowledge is pretty good. The models work well and have been correlated. So, there's a pretty good structure for determining distribution of blood levels. But, there will always be a debate about what's an acceptable blood level.
- We've learned more about lead impacts and standards have been ratcheted down as a result. But, poor science is a still barrier. You see a disparity of opinion if you review all the lead books. And, there's lead research done for industry that doesn't see the light of day because it shows a problem.
- Lead-contaminated sites are really a small part of what goes on and lead is way overrated as an issue, depending on site use. The money going into clean-up of contaminated sites should be into other areas with greater long-term benefits, like habitat acquisition.

Soil and groundwater as exposure pathways

- If soils are the problem implied by the numbers in the regs, we would see a lot more kids with high blood levels. And, in mining site studies, there has been only marginal improvement in blood lead levels following soil removal. It distracts people from what does matter if you pepper them with every possible avenue of exposure.
- Lead is not particularly mobile, it binds, does not migrate readily, although there are obviously some exceptions. But, from a transport standpoint, lead is fairly well-behaved. If there is no exposure, there is no risk.

Management of lead-contaminated sites

Assessment and notification

- The Catch-22 is that if I find a problem, I have to report it, turn myself in. Many people doing the reporting are not very sophisticated about environmental management and feel sucked into something that will cost them money, but they don't know very much about.
- A paradox lies in the difference between the notification and clean-up levels. At 399, we don't need to talk to you; at 401, notify and at the end of the day, you could have to remediate to 75 ppm. If the notification level is 400, then it makes no sense to have a Type I standard of 75.
- The good aspect of the lead rule is that you can identify if there's something you can do to mitigate the evaluation. If you can control access to site and lower the assessment score, or if you can clean it up in 30 days, you don't even have to report it. This is one of the best aspects of HSRA, a true incentive to take care of the problem.
- A notification level at 400 ppm is so restrictive and brings a lot of sites into play that may not be any problem at all. Most people would breathe a sigh of relief if their site was at 400. It may be that notification standard should be levels over 400 ppm, particularly if the agency's resources are limited.

Site characterization: Background levels and delineation to background

- It's hard to get a handle on true background for assessment purposes. It's site-specific, there are a number of anthropogenic sources, and there may be adjacent sites with high levels from other sources. It gets tied up in statistical analysis and debates between the regulator and regulated party, and there's no good guidance on the issue. And it affects clean-up levels. We need a mechanism to address whether we go to background in areas where background is high or whether EPD will hold us to the model result? If the latter, who will clean-up the other sites/sources that contribute to this high background?

Clean-up levels: Site-specific vs. default standards

- For Type II and IV, they say you can do site-specific risk assessment. But, you have to assume they are drinking the water and that the soil is available at the surface for exposure. So, it's not really site-specific.
- The degree of restriction in the system as a whole argues for higher default thresholds. An owner should not have to remediate to any level lower than the notification level, for example. They really could be using 400 and 1000 as Type I and Type III criteria. Or, if you use assume groundwater with 15 ppb in it, you can get a soil clean-up level of 930 ppm from the model. So, use that as a default level.
- EPD does need to err on the protective side, but from the industry standpoint, clean-up standards should still be based on science and factual evidence.
- Industry is not ignoring that there are sites that need to be cleaned up. But, there seems to be a policy element to setting up the science, putting the cart before the horse. Industry would have an easier time accepting the results if the deck was not stacked by the policy elements.

- Procedurally, HSRA is pretty good, pretty lenient. You have a number of categories you can put your site in. I don't know why anyone in the commercial-industrial sector would complain, because it's a flexible system that allows you to avoid active remediation.
- The crux of the issue is what's the standard? My industrial clients are interested in a risk-based approach rather than a bright-line, one-size-fits-all approach. And, I think that's workable in practice, the process is not fundamentally broke.
- The major problem with the IEUBK from a human health standpoint is that the chemical species of lead and its bioavailability in specific situations is not taken into consideration.
- Knee-jerk comparisons with off-the-shelf numbers means that there is a lot of overremediation going on out there. There should be another tier that allows a full risk assessment for a specific site.

Clean -up levels: Groundwater considerations

- One of the biggest issues with the lead rule is the presumption that groundwater is drinking water. So, you have to use a default value of 15 ppb because it's the Maximum Contaminant Level defined under the Safe Drinking Water Act. This ties back to leachability, and can drive soil levels lower than allowed by soil component of the model.
- Both models assume exposure through drinking water, so you end up using the groundwater default value even if there is public water supply. So, groundwater plays out in two major ways.
- There should be the flexibility to look at individually at sites where groundwater would never be used for drinking water. In some cases, the question should simply be is the soil a problem?
- There should be some set of criteria for what constitutes drinking water: certain yield, quality, characteristics of area, etc. A classification system would be a step to a more refined and reasonable policy that protects human health ~and the environment but doesn't force clean-up in areas not beneficial to anybody.
- I agree with EPD: in Georgia, all groundwater is potentially drinking water. Look at population growth, interstate water wars, etc. Someday soon, we're going to drinking that stuff. So, the groundwater protection standard for lead has got to be the drinking water standard. But, 15 ppm in some areas may just not be doable. Keep the standard but be able to then look practically: can we get it?

Clean-up levels: Comparing Georgia's approach to EPA and other states

- Stop futzing around on lead standards. If EPA came out with a new standard, then adopt it. Use whatever latitude EPA gives us, but pick a protective number and stick with it.
- There's a problem with inconsistency in levels under the lead rule and levels used by other agencies, including HUD's housing requirements. The default numbers should be changed to be more in line with other regulatory bodies that have done this from a science perspective: 400 for residential use; 1000 for non-residential use. These numbers are protective, and there are many precedents out there.
- Georgia's system does have tiers but does not allow a full risk assessment approach. I cannot think of any other state that does not allow a full-blown risk assessment approach, regardless of the thresholds they use.

- Nationally, there is disbelief and surprise as to why Georgia thinks their approach is better than California, HUD, EPA, the agencies that have expended a lot of resources on this. Why is Georgia such an outlier? It can only be that policy considerations are overruling the science; if so, they should say so.
- From business perspective, it's important for everyone to be on a level playing field. If one state does something one way, and another a different way, that can be a competitive disadvantage.

Clean-up levels: Average values versus bright line thresholds

- One important change would be to look at average numbers or use composite samples instead of bright-line or point values.
- Under the Georgia approach, you take all the data and look at it point by point. If a single point is greater than whatever the threshold is, you have a problem. In risk assessment terms, though, you can have a single point greater than a threshold without really having a problem.
- What Georgia calls risk assessment is a bright line, screening assessment: comparison of a single sample point at a single time with a single threshold. In true risk assessment, you look at an exposure area over time and use all data to statistically calculate an upper confidence level to get the exposure point concentration.
- And, exposure is important for protecting human health or the environment. For many sites, environmental concerns are not an issue, like industrial areas. If you can do a full risk assessment, you can look at that, including all the potential pathways of exposure.

Clean-up levels: Remediation vs. attenuation and control of exposure

- The remediation process is pretty straight-forward: dig and haul. At the end of the day, it is the quickest way to do it, as opposed to in-situ management and cost not withstanding.
- Depending on the species of lead, it may or may not be a problem. State's position is it's lead, clean it up. But, knowing whether it's bioavailable is huge factor. And, in-situ stabilization can be more cost-effective on some sites if the state would allow it.

Clean-up levels: Institutional controls and future use

- For lead in soil, it's a matter of access to the site which you can control with fencing or paving. If a site is encapsulated with impermeable cover, common sense says a kid isn't going to get to it.
- Institutional controls are needed. Take a site in downtown Atlanta that historically and for foreseeable future has industrial zoning. You may have a release, but is the release a problem? Need to look at routes and levels of exposure and interrupting exposure.
- The issue of how far the state should be going towards identifying end use vs. requiring clean up is a whole different issue. This is the wrong forum for that question; it should not be interjected in this.

Clean-up levels: Surface-subsurface differences

- Three feet under the surface, lead is not a problem. There should be a clear distinction between surface and buried contamination, perhaps with different levels triggering action for surface and subsurface contamination.

Clean-up levels: Financial impacts

- The HSRA program is perceived by people in the regulated community as overly rigid and overly restrictive, as having drawn a conservative line in the sand. From an environmental standpoint, I applaud that. From an industry standpoint, I see their point of view, they're spending a lot of money that they not need to.
- Industry is not looking to decrease standards to clean-up cheaper, they just want them based on science and factual evidence.

Administrative and procedural issues

Consistency in treatment of different compounds under HSRA

- EPD appears to be institutionally opposed to making changes because they have to maintain consistency with other compounds. But, lead just behaves differently, and the models already treat it differently.
- Georgia's bright line thresholds mean they are been disproportionately restrictive with lead, compared with carcinogens and how they are handled in the rules.

Regulatory flexibility and discretion

- The problem is not the rule, it's the administration of it. They are losing the ability to take the flexibility that they have and use it. Need to have and use the flexibility and that requires technical capacity. You need a standard that is clearly protective and the ability to vary from that within prescribed guidelines and then the personnel to do it.
- Full risk assessment would require more involvement on EPD's part; they would have to be willing and able to work with the regulated community because each site is different. Involved, educated regulators are very important and agency resources have to be sufficient; they need more toxicological know-how.

Procedural and programmatic inconsistencies

- EPD won't ride herd on the program they've created. Sites get stuck in limbo, we can't get the process off the mark, and they won't use the power of the state to facilitate moving forward.
- EPD work is done site by site and you only know when you get a notice of deficiency. There should be a way to get information on what EPD is looking for, rather than contextless, site by site decisions.
- Need more consistency in answers across the unit coordinators; managers should supervise staff more actively to improve consistency.

Risk perception and communication

- It's easy to say "this is bad" and ratchet down, but it's almost impossible to ratchet up. The public generally is not that well educated and thinks "if it may be a problem, then don't allow it." And, changing a standard can result in conflicts with earlier applications of the standard.

State agency

General concerns re: lead in the environment

State of knowledge on lead in the environment and human health impacts

- Our tests have become better at defining the endpoints to use as measurements of toxicity. As we became more refined in assessing damage, like cognitive problems in kids, then regulations can come behind and lower the levels. It's a potent argument for not being too lenient with lead in the environment.
- There is huge uncertainty around lead exposure and its impacts and that's for single compound. It's hard to give good answers to questions about additive effects or synergisms. So, apply the precautionary principle and act in a protective manner. As uncertainties decrease through more study and experience, I'm fairly confident that most cleanups will be based on higher numbers.
- In the grand scheme of environmental problems, hazardous waste and hazardous sites are relatively minor. The time and effort spent cleaning these sites is disproportionate to the environmental risk, but they are a political and regulatory concern.

Soil and groundwater as exposure pathways

- Lead is not as big an issue in Georgia as in some other states. We do have some sites with heavy lead contamination: old smelters, lead reclaiming operations. But, there are only have a half dozen sites with lead in groundwater higher than the MCL.
- Lead is not really mobile, is relatively insoluble, it does not travel far, it will sorb onto soil particles. It doesn't get into groundwater that easily. And, if it does, it doesn't really migrate. Of course, there are exceptions to everything.

Management of lead-contaminated sites

Site characterization: Background levels and delineation to background

- We don't have good guidance on this. The problem is that lead is ubiquitous, is urban and industrial, and we're trying to determine ambient conditions.
- If there is a naturally occurring concentration or concentration coming from another source, that does pose a risk and people in the area should at least be aware of it. But, is the industry responsible? Regulatory responsibility is a separate question.
- The rules specify a process to delineate to background and generally, we try to arrive at a delineation that makes sense. On most sites, we are able to reach some agreement on source, including source unknown an option. But, it's a difficult process. In a lot of cases, we have tried to proceed with the clean-up and push the delineation question off into the future.

Clean-up levels: Site-specific vs. default standards

- HSRA is different from other, more incremental statutes like the Clean Water Act. The Act and the rules dictate a philosophy that this is our one shot to clean-up this site. We will not be able to come back and require industry to clean-up to a new standard. EPD is cautious and aggressive in the clean-up standards. We are looking at the worst case and assuming that land will be used with human exposure when it is not now.
- We have generic or default clean-up standards that apply to all sites. We're glad to use those; they provide a high degree of protection to groundwater and human health.
- With the fall amendments, we can now establish site-specific clean-up standards. But, is it practical? Yes, for large company facing a potentially expensive clean-up. But, for smaller companies, site-specific information is hard to get. Data for Southeastern conditions is limited, but is improving over time.
- I'm aware of the protectiveness of the model. When I have people criticize the model, I think there's something to their criticism. It may not reflect real threats of elevated blood levels.
- Risk assessment is based on toxicity and exposure, so theoretically if you can determine that there is no exposure, the clean-up can be negligible. The gray area, though, is future exposure. There is wide disparity in ideas regarding how much contamination will occur from a site, and our uncertainty increases as the timeline increases.
- A polluted site is not necessarily a polluted environment. Definition of a polluted environment: accessible, where pollution has the potential to impact other people.
- EPD's mandate is to protect the state's environment. If a site-specific standard was primarily based on controlling exposure, that would still leave environmental media contaminated. This would put EPD in the position of saying, we will only look at human health and will only act if there's potential exposure. That's not consistent with a mandate to protect the environment as well as human health.

Clean-up levels: Groundwater considerations

- Generally, all groundwater in Georgia is naturally potable. There are very few situations where that is not true for shallow groundwater; of course at 2000', it's saline.
- The umbrella issue is future exposure to groundwater use, included shallow groundwater. This goes to EPD's stance that we will be relying more heavily on all groundwater, even in Atlanta. The lead rule is an entree to try to separate us from the policy that all groundwater is potential drinking water.
- There are two camps. One says, it's not used as drinking water, why clean it up to drinking water levels? The other says, we'll need it, so protect it now because it will be very expensive to clean it later. The latter is a water conservation approach: act today to save money in the future and to protect ecosystem values. The law requires us to protect the environment not just the drinkers of the water.
- Future water use is point of contention. Should we consider all groundwater to be drinking water or should we have some process in the rules where we can say this won't be drinking water and adjust clean-up standards accordingly? There's some validity to the latter, but our rules don't allow that discretion right now.

- In the equation that screens sites for listing, one factor is groundwater use. The other is the accessibility of contaminated soil to humans. If a site fails on either of these factors, then it could be listed. The vast majority of sites are listed for drinking water nearby or for a combination of drinking water and soil. Only a small percentage are on the list for soil alone.
- Calculation of soil clean-up levels is sensitive to groundwater but not simply driven by it. And, if we are going to consider all groundwater potable and that there will be future exposure, then it's sensitive for a reason. The onus is on industry to prove that they don't have lead in groundwater. That requires monitoring wells and is expensive to prove.
- A classification system would write-off parts of the groundwater now. That's the source of opposition to classification of the aquifer systems. The fact is that contaminated shallow groundwater does make its way into deeper groundwater; it's slow but it happens. Even in contained aquifers, aquitards can break down. Classifying the aquifer systems would make regulating the state's resources more problematic.
- The question of institutional controls in lieu of groundwater clean-up is an ethical one. We have a responsibility to do our job correctly and not leave it to future generations. It's a fundamental value question that will be difficult to resolve.
- We only hear from the most vested interests on this question of groundwater clean-up. The people of the state don't weigh in on this, and even representatives from environmental groups are part-timers. We're trying to look out for all interests, not just the loudest and best paid.

Clean-up levels: Comparing Georgia's approach to EPA and other states

- We rely on the federal government for methodologies about risk. The regulated community wants us to plow the ground of new methodology that's different from the federal approach, but we don't have the resources to do that.
- EPD's change in the EPA model was to look at leachability and add the groundwater transfer element in, which leads to lower numbers as the output. That increment could be very expensive to clean-up, but no law says we can't be more stringent than EPA. If EPD believes it is justified and technically feasible, EPD will pursue more stringent regulations.
- In developing the fall amendments, our stance was that, if EPA hadn't done it, we wouldn't accept it. But, where there was room within EPA's documentation, we accommodated some of industry's requests. So, we use a regional value for background blood level and the geometric standard deviation. We are more protective than EPA in incorporating groundwater ingestion, but if you take the groundwater component out, these numbers allow for clean-up values higher than EPA.
- We follow the range that the EPA Task Force does for the Bowers model and we will stick with that. The exception is that we consider groundwater. But, EPA's not uncomfortable with that and HSRA is a state act.
- The EPA policy on groundwater clean-up refers back to the state management plans and the state policy. Ours is an anti-degradation policy and I think we're on firm ground with that.

Clean-up levels: Average values versus bright line thresholds

- Because it's a regulatory arena, you ultimately have to determine a single numeric value. That's when you start looking at the more protective sides of ranges. Other approaches may good science but it's not what people really want, they want a number.
- The 95% confidence level is okay for risk assessments but how do you deal with site clean-up? We are not keen on letting people average away hot spots. And, HSRA has a tiered approach to provide alternatives within a bright line approach.

Clean-up levels: Remediation vs. attenuation and control of exposure

- That's one area of flexibility: get rid of source and contaminated soil and then watch groundwater and see what happens. If it doesn't decline, then pump and treat or treat in situ. But, without source removal and removal of soil that will leach at levels that would cause groundwater problems, natural attenuation is not an option.
- Natural attenuation is a viable method of remediation, unless a pollutant is leaving a site in excess of a drinking water MCL. If that's the case, then some sort of remediation becomes mandatory. If that's not the case, then there's more regulatory flexibility. You still need to clean-up but schedules can change, you can look at bio-remediation or attenuation.

Clean-up levels: Institutional controls and future use

- You can use institutional controls to control exposure in the short-term, and probably be very effective. But, how effective do they become as the time line increases? Are there going to be on- or off-site impacts? And, what is EPD's responsibility in this?
- Future use is not clear-cut and we are looking at the worst case, assuming that land will be used with human exposure when it is not now. That's why we have to have a policy that's protective no matter what the future land owner does.
- Institutional controls in lieu of clean-up are inconsistent w/ EPD's mandate to protect the environment. Allowing controls like that should be a public decision, not one made behind closed doors with industry on a particular site.

Clean-up levels: Model factors written into rule rather than guidance

- One issue is that all the models and risk assessment factors should be taken out and put in guidance. They should not be the rule. The science changes at such a rate that using it can't be done through a rule change.
- We can change some of the input parameters within current rules. But, there are places in the model where there isn't that have the flexibility. If EPA changes their standard for fetal blood level, for example, then the rule would have to change.
- That should be changed: the exposure factors that are written into the rule. Childhood exposure rates are not written into the rule and we have included that in guidance. But, for adults, these are in the rule and we can't use EPA's new guidance on exposure factors.
- We could have treated the model as guidance, which is flexible and can be changed. But, then the agency would be seen as lacking accountability. A rule is stronger, cannot be as easily changed.

Clean-up levels: Financial impacts

- It will affect a facility's bottom line if we tell industry to clean up to hypothetical future exposure. But, in lieu of a palatable alternative where we are seen as doing our job, that's the stance we're taking.
- The costs of the clean-ups we're trying to impose are not going to bust the bank, even for the mom-and-pop businesses we deal with.

Administrative and procedural issues

Consistency in treatment of different compounds under HSRA

- EPD's objective should be to manage and regulate lead releases in a manner generally consistent with other releases and consistent with the element/degree of risk.
- We can treat lead differently to some extent and we have done that. But, industry wants to look at lead and then generalize to other compounds. We can still adjust specific factors and numbers in the lead model.

Regulatory flexibility and discretion

- There is a lot of flexibility in the existing rules; we think there's plenty. But, the regulated community doesn't think there's enough. Of course, we get very little credit for the flexibility we do use.
- The rules do not provide discretion for a policy person like the Director but, there's discretion at the technical staff level. And, there is flexibility in the rules: industry can pick from category I through V.

Risk perception and communication

- The status quo makes management's job easier. The problem with changing anything, particularly if it becomes less protective, is it becomes an issue from a risk communication standpoint. It's hard to convince people, "This is as protective as the levels applied 2 years ago."

Environmental advocacy groups

General concerns re: lead in the environment

State of knowledge on lead in the environment and human health impacts

- There really isn't much debate about how harmful lead is and who is most susceptible. There is debate about the impact of chronic exposures but more data have come in on that recently.
- The most important thing is the recognition of how easily lead in soil, in loose dust, whatever gets into people. Lead is a human health risk and a lot of people don't know to take it seriously. There is a tremendous under-appreciation of the risks of lead.

- Lead-contaminated sites might be there but there are other compounds that are more dangerous; lead's kind of down on my list of concerns compared to toxaphene, etc.
- There is much more known about lead today than there was 20 years ago, and standards are much lower than 20 years ago. Who knows where they will be in 20 years? One has to assume that acceptable levels will be lower.
- Over time, recommended blood levels keep being revised downward. But here, they're trying to move standards upward. That's the wrong direction.

Soil and groundwater as exposure pathways

- It doesn't migrate in the soil, you can't argue attenuation. It tends to stay where it is, at least in the soil, but it must leach to some extent because they incorporate that in the models.

The communities impacted by hazardous sites

- The key issue is who's most affected: low income communities, low income kids who are likely to have exposures in addition to lead from a hazardous site. And, the solutions too often put the burden on the victim: "if you had better nutrition, you wouldn't be so susceptible."

Management of lead-contaminated sites

Assessment and notification

- The state needs to hunt more proactively for contaminated sites. You need more and better cops doing the government's own testing.
- Overall, more aggressive and even-handed investigation and remediation of hazardous sites in Georgia is needed.

Site characterization: Background levels and delineation to background

- They say, "we'll evaluate this in terms of comparison to ambient levels." Well, that's not protective enough of the environment.
- We have learned in the Superfund program that samples are critical to defining a site. There's so much discretion, so much room for property owner to sample to get the desired results.
- EPD has to rely on industry's assessment. The process is only as good as the data received, and the data is highly suspect. There are reasons to suspect that the data reflects the views of the people paying for it.

Clean-up levels: Site-specific vs. default standards

- Like most environmental groups, we leaning toward the less lead, the better. Goals should be preventing environmental damage rather than trying undo it once it's done, and preventing harm to the environment as well as humans.

- There's the age-old question of how clean is clean? An awful lot of energy is expended in debate over does it have to be cleaned up and how far. Whoever is responsible ought to clean it up; from my perspective, a neighbor doesn't have the right to condemn someone else's property.
- EPA doesn't get that concerned about lead until levels are very high. The 75 mg/kg should be kept as the Type I standard. That's an area where Georgia is ahead of the game, compared to EPA's 400 mg/kg, which is not that protective.

I'm wary of site-specific exposure factors and an approach that historically has allowed higher levels of contamination. I recognize that you have to have flexibility to take site-specific considerations into account, but where do you stop? Haggling over every detail like a contract negotiation does not protect people.

- We need national standards rather than site specific standards to insulate us from the trend toward devolution, to provide a federal safety net.
- We need to cleanup our messes to the highest standard science allows us. They want to leave things at a level we know would put us at risk, even given current knowledge. That will limit what next generations can do with that land.

Clean-up levels: Groundwater considerations

- I've heard the state's policy that groundwater needs to be treated as drinking water. And, I've heard companies argue, but that's not true, it's not drinking water, and then the state backed off. So, first, tell us what the policy is. Have a bona fide policy and apply it uniformly.
- We should consider groundwater to be potential source drinking water. It's an incredibly important resource. Look at the growth of the state. And take the examples of the pressures on groundwater on the coast and the moratorium on new wells in part of Richmond County, put in place because of groundwater contamination.
- People say they can predict what will happen to groundwater at the source. They say they can assure us that they can contain contamination at the source, in perpetuity, so this doesn't have to be treated. I don't believe that and think it's a dangerous precedent to set.

Clean-up levels: Comparing Georgia's approach to EPA and other states

- How do GA rules stack up against other states? It would be wise to know.
- There seems to be an over-reliance on what EPA has done. That's good in that its easier for EPD to justify their positions and withstand industry pressure. But, EPA doesn't get that concerned about lead until levels are very high.

Clean-up levels: Average values versus bright line thresholds

- You know, to lay people, a bright line has some advantages because you don't get into the subjective. Clean-up levels should not depend on who is the site manager on a particular day.
- The danger with averaging is the discretion in the sampling that defines the average. The problem is a lack of resources on the agency's part. With more resources, there could oversight of the sampling approach or a QA-type sampling by the agency.

Clean-up levels: Remediation vs. attenuation and control of exposure

- You have to assume that there will be future use of the site, active exposure in the future, even if it's abandoned, even if it's fenced. And, the lead's not going to leave. A fence is not remediation.

Clean-up levels: Institutional controls and future use

- If you are going to rely significantly on physical barriers, then you need to make those provisions stronger and make sure that they have teeth, that they stay protective and don't deteriorate in 10 years.
- In Florida, institutional controls have not been very effective. They are very hard to enforce, require coordination between state and local government, difficult to achieve.
- Institutional controls in lieu of clean-up means that, after the tenure of today's decision makers, the future will face a clean-up that's likely to be more expensive due to movement from the source.

Clean-up levels: Surface-subsurface differences

- It's good that in the residential scenario, the standard is the same for subsurface and surface; that should be kept.

Clean-up levels: Financial impacts

- We need information on industry's economic realities on which to base our decisions. I don't want to drive industries out of business. We're weighing their financial ability to do the right thing with what they need to do to protect human health and the environment.

Administrative and procedural issues

Regulatory flexibility and discretion

- The core problem with the hazardous waste program is the lack of uniformity. The guise for that is flexibility and you want some site-specific flexibility, but you can pretty much get an engineer to tell you whatever data you want. Flexibility is a good thing until it becomes abuse of discretion, and that's what happens here.
- There is a problem with poorly-defined decision criteria, which allows "administrative discretion" and subjective, erratic or preferential decision making.

Procedural and programmatic inconsistencies

- Look at the administrative process by which challenges can be made directly to EPD. The process at the Office of State Administrative Hearings has evolved to be almost incomprehensible. The procedures, and in some cases, the laws and regulations don't make sense. And there are procedures that aren't written down that in conflict with those that are written down.

Sector-specific issues

EPD decision making and public trust

- If I believed the system was politically immune, I would be more likely to trust what EPD says. But, right now, trust is very low due to systematic problems in enforcement. If agencies would just enforce the laws that are on the books, that would go along way toward restoring public trust.
- EPD is ham-strung by the political process. The Director is appointed, and therefore is not accountable, is removed from people.
- As long as Harold Reheis is head of EPD, I'm not sure people will be willing to give their time because they don't think he's going to do anything different. It's top down, it all depends on the leadership.
- Environmental policy in GA is power-driven. There's a politicking of science that leads to the politicking of environmental standards. A company stands up in court and says, "but EPD says this safe." Well, they never said that, but EPD backs off due to pressure from politically powerful. It has nothing to do with safety; instead, it's politics.
- EPD enforcement activities vary in direct proportion to who the defendant is and how good the defendant's attorneys are. When they criminally prosecute for environmental crimes, they go after the little guy not the big guy. This is due to understaffing, under-budgeting, and to some extent, political philosophy.
- Any success we've had has been from dealing at the federal level. We have to go to the federal level because EPD is so politically connected. A greater EPA role in oversight is needed. I know HSRA is a state law, not a delegated program, but we need a greater EPA role in terms of actually dealing with hazardous waste sites. Again, this reflects a lack of strong protection mandate from EPD.

Health sector

General concerns re: lead in the environment

State of knowledge on lead in the environment and human health impacts

- If you target the two most vulnerable parts of the population, fetuses and small children, then you will be doing what the populace wants and needs. When you take care of those two, you almost always take care of adults.
- The mean population level in children is now 2-3 mg/dL blood. And, many will say there is no threshold for lead impacts on the brain. Prehistoric "background" levels were 200X lower than current mean population levels; from a population perspective, we're right on the margin. There's ongoing research showing neuropsychological differences in newborns to women where 10 mg/dL is the high end of the range. There are, of course, other injuries that lead does to the body that do have a threshold.

Soil and groundwater as exposure pathways

- The key exposure issues are dust and dirt and who has access to it and how it can be distributed. Our knowledge is not very good on the question of soils as a vector for lead from paint. We need more information there, but again, it's a question of priorities.
- Water is an exposure issue to a substantially lesser degree. Lead getting from soil into water supplies has not been a major issue in the U.S., at least from a child standpoint. Groundwater just hasn't been a source for lead-poisoned children. We've done a good job of watching for water contamination. Future money needs to be spent elsewhere than water contamination.
- Lead is present at the few sites in this area but not at the same level as hydrocarbons, arsenic. But, I'll tell you, it gets the attention of the adult population living in the area. In my opinion, it's a detriment to getting done what needs to be done in other areas, like lead-based paint in old homes.

The communities impacted by hazardous sites

- One impact that is becoming more and more apparent is the anxiety from living next to a hazardous site, an impact on top of any actual exposure from the site.

Management of lead-contaminated sites

Clean-up levels: groundwater considerations

- The current MCL is probably okay. If you drink water with that level, almost no one will have an elevated blood level.
- I don't know how our water use will change with growth, but we do need to keep that view toward the future. I'm not putting down work to try to keep water clean; that's important.

Clean-up levels: Institutional controls and future use

- For all sites, you must ask if children will be ever be present now or in the future. Sites may be fully fenced but, for example, have a gully discharging to an adjacent swamp where kids play.
- People are clever about finding ways to get around obstacles. How are you going to make sure institutional controls are effective? I wouldn't do away with them but, I don't see how they're going to work.
- Fencing is better than nothing in most communities. But, it's seen as a band-aid: the bad stuff's still there, so what are you going to do about that?

Local government

General concerns re: lead in the environment

Soil and groundwater as exposure pathways

- Lead in raw water has not been a common problem; it might be a problem if there's a groundwater source or an industrial self-supplied source but it's certainly not common.

Management of lead-contaminated sites

Assessment and notification

- The disjunction between notification and cleanup limits doesn't make any sense.
- Regarding water industry infrastructure, there should be uniform treatment for everyone. We test for responsible clients but others don't test, they never find lead contamination. EPD may have to specify procedure for soil testing prior to painting a tank, with the owner required to submit the results. That would give us a level playing field.

Site characterization: Background levels and delineation to background

- Sampling procedures are a concern and EPD doesn't give much guidance. With experience, you can see blasting sand and avoid it in the sampling so that everything looks good. It would be easy to do "unscrupulous" sampling.

Clean-up levels: Site-specific vs. default standards

- The low limits to which we've had to clean sites are a problem. They are costly and time consuming, and we just couldn't meet some of the time requirements. Clean-up requirements should be realistic, especially compared with areas around a site like adjacent railroad lines. Clean-up levels should be realistic compared with other levels in environment.
- There should be simpler statement of requirements. It seems like they could set up a table of some kind, listing background levels in GW and then come up with number like 1000 mg/kg.
- You do need to be careful regarding the residential/non-residential scenarios. What's not residential now could be residential tomorrow. Non-residential places should be the exception and should be handled under a different rule. Other than that, for 90% of the state, lead-contaminated sites could be handled under a simpler rule.

Clean-up levels: Groundwater considerations

- Groundwater is a primary source of drinking water. A plausible assumption is that as our population grows, groundwater resources will be in ever shorter supply. Programs to manage hazardous sites should direct that uncontaminated groundwater be protected. Protecting uncontaminated groundwater is just as important if not more important than cleaning up contaminated groundwater.

- Groundwater's current or future use should be evaluated before remediation decisions are made. Preferably, this evaluation would be based on comprehensive state evaluations of groundwater needs, or in the context of a comprehensive state groundwater protection program. The availability of alternative sources of drinking water should not be a factor in this evaluation.
- The MCL is appropriate as a remediation standard. And, when applying the MCL, regulators should ensure that GW is treated to a level that is "reliably and consistently" below the MCL, a standard used by drinking water suppliers to ensure compliance with the Safe Drinking Water Act.

Clean-up levels: Remediation vs. attenuation and controlling exposure

- Limited natural attenuation is a legitimate remedy but should not become an excuse for doing nothing. And, it is extremely important that the current preference for treatment and permanence in remediation be continued.
- Actions to meet groundwater remediation standards may be technically unworkable or inordinately costly. Nonetheless, a public health risk still remains. Alternative remedies to reduce that risk include containing the pollution source, protecting uncontaminated groundwater, and preventing human ingestion.

Clean-up levels: Institutional controls and future use

- Deed restrictions don't make sense: if something needs to be cleaned up, then do it and don't avoid it by listing on the deed. But, deeds are a way to track the areas that don't get cleaned up.
- Zoning ordinances and other institutional controls that artificially restrict access to groundwater have no bearing on whether a given aquifer will be needed in the future. Institutional controls should be a supplement to, rather than a substitute for, other response measures, thus recognizing the value of groundwater as a potential drinking water source and promoting a long-term view of clean-up efforts.

Administrative and procedural issues

Procedural and programmatic inconsistencies

- The current lead rule is hard stuff to read and you get different responses from EPD. First they say that if a site is fenced, you don't need to clean it up. Then they say, if it's on the surface, it may blow or run off, so yes, you do have to clean it up.

Sector-specific issues

Infrastructure maintenance

- From a PR standpoint, water suppliers are jeopardized by levels high enough that a site will be defined as a contaminated site. Think about the newspaper headlines: "Water tank on hazardous waste site."
- If I find lead and have to clean up, it's easy to mix it in and get lower levels rather than really cleaning it up. Mixing is a key concept.

- Anytime a water tank is painted, it would make sense to require testing of the paint lead level before removal starts. Then, EPD could set action based on paint lead levels: if <600 just protect worker; if <600-1000 just contain and haul it off; if >1000 then something else. Assess lead levels and then set actions rather than just specifying cleanup afterwards.

ANALYSIS OF KEY ISSUES AND CONCERNS

Looking across the issues outlined in the previous section, groundwater considerations emerge as a major concern regarding lead-contaminated sites. This issue was presented as rather contentious, and received considerable attention from all industry respondents and a majority of respondents from other sectors. The lead rule defines a groundwater standard for both default and site-specific types of clean-up, with groundwater entering the calculation of site-specific standards through a groundwater component as well as the soil component. A key consideration is the state's policy presumption that all groundwater is potential drinking water, the underpinning of the groundwater standard. These provisions have significant implications for clean-up of lead-contaminated sites and, as importantly, have implications that extend well beyond the lead rule and HSRA as a whole.

Other issues were also emphasized by multiple sectors. The majority of respondents from all sectors, except health, addressed the question of site-specific versus default standards. As described in the previous section, the lead rule provides both default clean-up levels that can be applied to any site and a procedure for calculating site-specific clean-up values. Respondents from EPD, environmental groups, and some consultants indicated a basic comfort with the default approach, while many industry respondents and the remaining consultants focused on the potential for site-specific assessments, the value of a risk-based approach rather than a one-size-fits-all approach, and concerns about the default levels. EPD, industry, and consulting sector respondents also commented on the site-specific option provided by the 1999 amendments, noting that this aspect of the rule is fairly new and has some problems in implementation.

In general comments on clean-up levels, a number of respondents referenced the need to determine a clean-up standard that is "protective of human health and the environment." These comments, however, reflect divergent interpretations of the phrase. Many treated human health impacts as the sole focus, while others emphasized both human and environmental impacts.

Georgia's approach compared to that of EPA and other states was discussed by a majority of respondents from industry and state agencies, and also by a smaller proportion of consultants and environmental advocates. Industry respondents and several consultants highlighted the ways in which Georgia's standards are more restrictive or stringent than those used by EPA and other states, noting that this has implications for clean-up costs and a company's ability to compete nationally. Respondents from EPD emphasized the ways in which Georgia's approach follows that of EPA and the policy rationale for the ways in which it is more stringent than EPA. Environmental advocates, in turn, questioned how Georgia's standards compare with other states and noted that there are reasons to be more protective than the federal standards.

Institutional controls were discussed by a majority of respondents from local government and the health sector and by 35~45% of respondents from the other sectors. Comments from local government, health, and environmental advocacy respondents questioned their adequacy and effectiveness, with local government comments stressing that institutional controls should supplement, not replace, other response measures. Respondents from EPD emphasized the uncertainty about future conditions and the view that substituting institutional controls for clean-up is incompatible with the agency's mission. Industry and consulting sector respondents, in contrast, highlighted the utility of institutional controls as a way to interrupt exposure pathways and prevent future exposure.

Finally, the state of knowledge on lead in the environment and its human health impacts was highlighted by the majority of respondents from the consulting, environmental advocacy, and health sectors as well as a smaller proportion of respondents from the other sectors. There was a wide range of opinions among respondents, with some seeing the state of knowledge as quite good and others focusing on uncertainty regarding exposure, additive effects and/or impacts at low levels of exposure, in particular.

In short, a handful of issues were emphasized by the majority of respondents from multiple sectors. But, these issues are only part of the story. It is very important to note the array of other issues highlighted as significant by subsets of respondents (listed in Table 1 and summarized in the preceding section). Some of these issues may prove to be productive areas for discussion and should be kept in mind as consensus-building on further revisions to the lead rule is considered.

Looking at responses from each sector, it is not surprising that the issues most heavily emphasized by industry respondents relate to determination of clean-up levels. Concerns about site-specific versus default standards, groundwater considerations, Georgia's approach in comparison to federal and other states, limitations in application of models, and the use of bright line thresholds versus average values were cited by a majority of respondents from this sector.

Respondents from the consulting sector emphasized two of these issues: site-specific versus default standards and groundwater considerations. In addition, a majority of respondents from this sector also addressed the state of knowledge on lead in the environment and human health impacts, one of the issues that define the context for discussion of Georgia's regulations for lead-contaminated sites.

Responses from state agencies, primarily EPD, placed the greatest emphasis on groundwater considerations and comparison of Georgia's approach with that of EPA and other states. A majority of these respondents also discussed two issues emphasized by other sectors: site-specific versus default standards and the use of bright line thresholds versus average values. In addition, a majority of respondents from this sector highlighted the issue of regulatory flexibility and discretion, a topic addressed by a smaller proportion of respondents from the other sectors.

Responses from environmental advocates also strongly emphasized groundwater considerations and concerns about site-specific versus default standards. In addition, a majority of these respondents focused on the state of knowledge on lead in the environment and human health impacts. And, over 70% highlighted sector-specific concerns about EPD decision making and public trust, another issue that helps define the context for discussion of Georgia's regulations for lead-contaminated sites.

Points of emphasis for respondents from the health sector included the state of knowledge on lead in the environment, specifically human health impacts, and groundwater considerations. A majority of respondents from this sector also discussed soil and groundwater as exposure pathways and concerns related to institutional controls, both of which were addressed by a smaller proportion of respondents from other sectors.

Local government respondents, in turn, focused on issues related to both contaminated sites and water supply sources. Site-specific versus default standards, groundwater considerations, and institutional controls were highlighted by a majority of respondents from this sector. In addition, these respondents emphasized issues that arise from maintenance of infrastructure, issues that clearly relate to various types of infrastructure (e.g., water tanks, bridges, storage tanks). In these interviews, however, they were only raised by local government respondents concerned with water industry infrastructure.

In summary, interview respondents highlighted several concerns that define the context of any consensus-building effort. They also identified a palette of issues that could be considered in a subsequent facilitated process. These issues vary widely in scope of concern and in potential implications of any changes in state regulations, which in turn has implications for the approach to a subsequent consensus-building effort. Respondents' expectations and preferences for such a process are summarized in the next section of this report, and specific recommendations for a consensus-building process follow in the final section.

INTERVIEW RESULTS: EXPECTATIONS AND PREFERENCES FOR CONSENSUS-BUILDING

Product

The majority of respondents from industry stated that the product they would prefer is the text or key constructs for a draft rule. Further, some of these respondents indicated that this would be their minimally-acceptable product.

Others, however, acknowledged that this is an iterative process and felt that systematic discussion of science and policy issues, development of guidance, or mutual education would be acceptable products for a subsequent consensus-building process. These less ambitious results are seen by some industry respondents as more realistic expectations.

Some consultants also saw value in working toward a draft rule as the product. Others, however, placed greater emphasis on mending fences, building a more collaborative approach across sectors, and developing consensus on specific policy questions. These less formal products were seen as more immediately useful and applicable to other topic areas than negotiating specific language for the lead rule.

The product preferred by respondents from EPD depended, in part, on the focal issues selected. These respondents indicated that, for a focused set of issues or for issues that are narrower in scope, development of common ground on future rule changes and specific guidance would be fruitful. On the other hand, for broader issues like the presumption that groundwater is potential drinking water, accomplishing an open exchange of views may be the most practical product. Building better understanding and collaboration across sectors was also cited as a more general product for a subsequent consensus-building process.

Among respondents from environmental advocacy groups, the health sector, and local governments, views on the preferred product varied more widely. Some environmental advocates felt that the text or key constructs for a draft rule could be accomplished if the process is structured correctly. Others identified an assessment of statutory deficiencies or identification of options for funding clean-ups as desirable products. Many of the respondents from these three sectors, however, simply stated that they didn't know what the product should be, that they didn't have enough information on the rationale, need, or purpose.

Participants

Overall, there was a general feeling among respondents that the suite of sectors represented on the convening committee is the appropriate core from which to draw for a subsequent consensus-building process. A number of respondents reviewed the sectors represented there and asked, "Who would you leave out?"

Several respondents suggested involving high caliber, independent experts, perhaps through a science advisory panel of some sort. An array of other additions were suggested: DHR's Environmental Health Section; regulated government agencies including the Department of Transportation, Department of Defense, Georgia Ports Authority, and the University System; USEPA; the housing sector; fisheries experts; and a representative of the Attorney General.

Others, however, cautioned against complicating the process by going beyond the sectors represented on the Steering Committee, and suggested that participants outside the regulators and the regulated community be selected with caution and judgment to ensure that they have sufficient technical background and truly represent an organization. For some topics, it may be necessary to work with a smaller group of people with solid technical backgrounds who are sensitive to policy implications.

Some respondents felt that, at its heart, this is an EPD-industry concern. In their view, the process should be open to other parties, but if they don't respond to the invitation or engage in the process, that is fine.

To others, the process will only work if there is adequate representation beyond EPD and regulated industry, particularly if the goal is development of constructs for a draft rule. Respondents with this perspective stressed the importance of engaged participation from representatives of affected communities. Constraints on participation and limited technical background, however, are a particular concern for this sector and for environmental advocates. Respondents suggested provision of resources to enable participation from these sectors, and recommended incorporation of independent expertise as a way to address limited technical capacity.

Barriers to success

The barriers cited most often by industry respondents were entrenched positions, fixed agenda, and unwillingness to change. Some saw this as a particular problem among representatives from EPD or environmental advocacy groups, but most stated it as a general concern across potential participants. The prior history between EPD and regulated industry was also cited by several respondents as a major barrier; specific dimensions of concern include EPD's record of disregarding previous agreements and industry's record of over-reaching and shot-gunning issues in negotiations.

Several industry respondents noted that major barriers lie in EPD's risk-averse approach to regulation and reluctance to incur criticism from environmental groups or the public. Similarly, a number of industry representatives noted the potential problem of environmental groups not participating or not fully engaging in the process. Other barriers cited by single respondents from industry included the necessity that EPD shift out of a command-and-control mode, the range of views of acceptable risk, differences in technical capacity and jargon, and a skepticism among industry that such a process would yield any benefits.

Consultants see similar barriers: fixed agenda across potential participants or on EPD's part; prior history; and distrust between EPD and the regulated community, between regulated parties and environmental advocacy groups, and within the environmental community. The prior history between EPD and regulated industry is a key rationale for broadening the process to include other parties. Political constraints on the process, with EPD starting from a relatively protective position and risking perceptions of "caving in" was also seen as a major barrier. Other barriers cited by individual consultants include time constraints, insufficient information and a propensity for emotional response, and a lack of a shared need to resolve differences.

Barriers identified by respondents from state agencies parallel some of those listed above. The prior history between EPD and industry or environmental advocacy groups was cited most often. Specific concerns include the sense that industry tried to take a mile when EPD gave an inch, experience with comments made in open discussion coming back to "haunt" EPD staff, and adversarial processes apparently having become the norm. Respondents from this sector also noted that two additional factors are major barriers: time and resource constraints limiting participation by both EPD and environmental advocacy groups, and lack of technical information and knowledge among environmental groups. Other constraints cited by individual respondents from this sector included the presumption that higher numbers are unsafe and inconsistent with the agency's mission, the political realities that affect discussion of high profile issues like groundwater, fundamental differences in philosophies, and substantial differences in motivation to participate across sectors.

Among environmental advocates, the barrier cited most often was a lack of trust in the state's environmental decision making and in EPD. Several participants referenced a likely "end run" to manipulate the process and a disbelief that EPD will change their ways of operation. Other major barriers include resource constraints faced by advocacy groups, the technical requirements, insufficient science, and a lack of trust in the numbers. Finally, single respondents from this sector and the health sector also cited problems with entrenched positions, cooptation of participants, limited understanding of others' perspectives, and resistance from those who will bear the burden of any changes in regulations.

Conditions to encourage participation in a consensus-building process

As the final step in each interview, respondents were asked to identify conditions that would encourage their participation in a subsequent consensus-building process. The conditions listed are summarized by sector below.

Industry

- A well-defined process with clear product or endpoint, ground rules, deadlines, milestones, and commitments to meet them:
 - Identify and prioritize issues at the outset.
 - Select issues, get information about other ways to do things, then define the problem.
 - Explicit ground rules with facilitator and participants willing to enforce them.
 - Definitive time frame and schedule with agendas published ahead of time.
 - Defined decision rule (e.g., can you live with a proposal?).
 - Documentation of agreements, dissenting opinions, and final decisions.
 - Encouragement of active participation by all at the table.
- Include the following components in the process:
 - Use smaller working groups.
 - Undertake collective education.
 - Use outside expertise and information sources without pitting experts against each other.
 - Put the science on the table first, then look at policy considerations and the more interpretive issues (although the line between the science and policy issues may not be that clear).
 - Provide a technical primer on issues for participants who do not have a technical background.
- Have an explicit process for selection of participants who will act in a representative capacity, are open to new information, are willing to change, and have the background necessary to understand the technical issues.
- Up-front buy-in to process, commitment to on-going participation.
- Independent, active, neutral facilitator.

- Participation from all levels within EPD: the people who can make the decisions as well as the people with the technical information.
- Provide avenues for participants to brainstorm, express opinions, explore ideas without comments being taken as a binding commitment.
- Have a clear understanding of what will be done with the product and mechanism(s) to ensure EPD accountability following decision making. Let participants know what happens or doesn't happen and why.

Consultants

- Have a defined process with a clear product, specific agenda, and time frame that allows enough time but does not take too much time:
 - Prioritize issues and establish deadlines for each.
 - Establish a common information base in terms everyone understands.
 - Use outside expertise: an independent science advisory board that answers questions defined by the full group.
- Participants who are open-minded, are good communicators, are open to new information, are willing to be educated, and with less entrenched positions. In addition, participants should have the authority to represent their sector or positions.
- Take two items as the starting point: we do not want to expose children to a neural toxin and we do not want to spend money cleaning up the wrong things.
- Keep the group's role in mind: it can make recommendations but the EPD Director is the final decision maker.

State agency

- Have to ensure that it is an open process.
- Agree to resolve a defined set of issues and stick with that set; avoid shot-gunning of issues.
- Build in steps to establish trust and get beyond the baggage from our prior history.
- Encourage open participation by people from all levels of EPD.
- Effective facilitator.
- Have an operating procedure to keep things moving forward so industry does not blindside us on new issues.
- Have public weigh in on the policy factors and take the outcome of the process up in the appropriate public forum, subject to formal public comment (e.g., Board of Natural Resources, General Assembly).
- Recognize EPD's limited resources.

Environmental advocacy groups

- Have a clear understanding at the outset of the authority of the consensus-building group, the purpose and product, and how the product will be used:
 - Have control over how our comments will be used, with the right to withdraw if comments are taken out of context and misused.
 - Use smaller working groups.
 - Balance two imperatives: 1) making it a binding consensus and ensuring that the results will be used, and 2) reserving the opportunity for participants to voice the things they cannot accept.
- Find independent, outside expertise who can speak with one voice: avoid dueling experts, provide independent verification of models.
- Look at best science, with assistance from the best experts, presented in terms lay people can understand, and then act on the facts.
- Want a demonstration that EPD will enforce existing laws.
- Spread meetings out over time, so we can participate but still meet other demands.
- Resource constraints may mean time is needed to seek funding/support for participation.

Health

- Take protection of children and pregnant women as a starting point.
- Make sure that any changes in regulations treat everyone equally.
- Be able to communicate the implications of any changes at the community level, including the implications for specific communities impacted by hazardous sites.
- Be clear that final decisions will be made by those who should be making them; the formal decision makers bear the responsibility for decisions and their implications.
- Have adequate financial support for the process.

Local government

No conditions specified.

RECOMMENDATIONS FOR A SUBSEQUENT CONSENSUS-BUILDING PROCESS

Design considerations

Two factors are key considerations in the design of a consensus-building process. The first is the degree of common interest in resolving outstanding differences. On this point, interview results indicate that, across sectors, there is not currently a high degree of common interest in resolving differences:

- Regulated industries are highly motivated and have strong incentives to change the status quo; are seen as driving the continued debate.
- Among consultants, some see a compelling need for change in the status quo, while others see the rule as workable as is, with perhaps minor changes needed.
- Among EPD respondents, there is interest in getting some closure on the debate and the recognition that revising rules is part of their job. EPD respondents, however, also stated that they are generally comfortable with the rule as it stands, particularly given the recent improvements.
- Among environmental advocates, some are open to exploring changes in the status quo, while others are actively resistant.
- In the local government and health sectors, respondents generally did not have the information to assess needed changes. Some did question whether changes are needed; the status quo may be sufficient.

A second key consideration is the environment for consensus building. Five aspects of the decision-making environment are particularly salient to the potential for consensus-building on further revisions to the lead rule:

- The ad hoc process that led to the 1999 amendments is generally seen as a contentious, relatively unproductive process that took a lot of time and resources. There is some resistance to making further “concessions” by both industry and EPD.
- EPD resources are limited and have to meet on-going demands in addition to the new demands of a consensus-building process, a process that is inherently time-intensive.
- There is lack of history of applying consensus-building approaches in the regulatory arena in Georgia.
- EPD decision-making and “public trust:” an environment of distrust between industry and EPD is exacerbated by deep distrust of EPD by environmental advocates.
- A common driver across sectors is lacking: there is not a strong belief that something will change the status quo if consensus-building does not occur or is not successful.

Recommendations

These considerations mean that, at this point, it will be difficult to undertake a consensus-building process with very ambitious goals. Further, it is critical that any consensus-building effort be designed to establish credibility and legitimacy and to provide effective participation. Given these considerations, the contractor makes the following recommendations.

Focal issues and product

Focal issues should be selected early in the consensus-building process. Interview results and the factors described above strongly suggest that the selection process be designed to identify a limited number of important *and* tractable issues to be addressed initially. If successful, then, the process could be extended to address less tractable issues.

- ~ The scope and goal of the consensus building process should be defined by participants and will depend on the focal issues. For more narrowly focused issues, the decision process could be designed to identify areas of agreement and disagreement and then extract constructs for a rule revision. If such constructs are developed and agreed upon, they would be forwarded to EPD for inclusion in amendments to the rule.

For broader issues, the goal or product will probably have to be less ambitious. For example, the state's policy presumption that all groundwater is potential drinking water addresses a significant state resource and changes in this policy would have implications beyond the lead rule.

Given this and the decision environment described above, it is the consultant's opinion that this presumption cannot be productively addressed in the context of consensus building on revisions to the lead rule specifically or HSRA rules generally. It should be noted, however, that a number of industry respondents cited this presumption as one of the most important to address. If selected as a focal issue, a much broader process of public input and debate would be required. And, the initial goal of such a process may be limited to simply identifying areas of agreement and disagreement.

Ground rules

- ~ Common ground rules for consensus building should apply, including protocols for reaching agreement. The facilitator should be neutral and acceptable to all parties, with periodic anonymous evaluations built in to the process to ensure that facilitator neutrality holds.
- ~ The desired product of the process, its intended use, and the use of any written records or individual statements should be specified and agreed upon at the outset.
- ~ Decisions should be documented by the facilitator. If or when consensus is not reached on a particular topic, it would still be useful to document areas of agreement and the dissenting views.
- ~ To provide accountability, a follow-up meeting should be held 3 months after completion of the consensus-building process. The purpose would be to discuss what EPD has done with the results (including reasons why agreed-upon actions have not been taken, if that occurs).

Participants

- ~ Participation should be structured along the same sector lines as the convening committee. Explicit commitments to participate should be solicited and made as part of the recommended decision sequence presented below.
- ==> Consensus-building processes are based on the concept of "representation." It is important to recognize the difference between representing an organization versus representing a perspective. In the lead rule context, some participants will be able to represent an organization. However, for the health and local government sectors in particular, participants may simply represent a perspective that is critical to the discussions. Who or what each participant is representing should be made explicit at the outset.

It should be noted that, aside from EPD, no participant can represent a sector as a whole and the process should allow for sector-specific discussion of areas of agreement and disagreement.

For the industry and consulting sectors, participants should be identified who can represent broad concerns and perspectives, rather than push agendas or “science” based on implications for a particular site.

- ~ Open participation by both EPD management and HW staff is critical. The process should be designed to encourage that participation without general discussion being seen as a commitment and to ensure that, when appropriate, decisions and commitments by all parties are made explicitly and documented.
- ~ Steps should be taken to encourage participation from interests beyond EPD and industry representatives (i.e., go beyond simply inviting it). A recruitment process will be needed to identify the appropriate people and encourage their participation. Some of this has been done during the interview process.

Provisions should be made to offset at least some of the expenses of participation. The minimum that is recommended is to offer reimbursement at the state per diem rate to any participant who requests it. If funding is sufficient, stipends should be offered according to specified criteria.

If participation from representatives of affected communities and/or public interest NGOs is not sufficient (i.e., those perspectives are not adequately represented), a focus group process should be considered as a supplement to the main consensus-building effort.

Recommended decision sequence

- 1) Hold a half-day education session to address the questions: Why are we talking about changing the status quo and what are the implications for social values? The session should be held at a time that does not pose obstacles to participation (e.g., Saturday from 10:00 to 3:00 with lunch included).

Credible, independent presenters should be recruited to discuss the following topics:

- Approaches taken by other states and federal agencies: How do Georgia rules stack up against other states?
 - Relationship between blood lead and exposure to environmental media.
 - Recent studies of impacts of low levels of lead exposure.
 - Economics of remediation.
- 2) Opt in or opt out of further participation: Give participants to date (i.e., interviewees and attendees at the education session) the opportunity to commit to participation in the next step in the process. The goal is to identify a set of committed participants that tracks the composition, but not necessarily the size, of the convening committee. If there is a disproportionate number of volunteers from a sector, interested parties from that sector should select a smaller number of representatives. Any contractor(s) should also assess their expected fit with the next step and opt in or out at this point.

- 3) Select focal issues and identify tentative product(s) for consensus building. The issues identified through interviews and outlined above provide a starting point for selection of focal issues.
 - a) People who, in step 2, committed to participate in this portion of the process will be given an opportunity to add or refine issue statements. This can be accomplished through written input, work by a subcommittee selected by the full group, or in a full group meeting.
 - b) In a full group meeting, select focal issues. The session would be designed to specify the place(s) to start in step 5, and would use group decision support technology to facilitate issue selection. Available tools include modeling to identify intervention points and polling to rank issues on paired criteria. As described above, importance and tractability (i.e., easily handled or managed) are expected to be the criteria for selection. The decision support tools and criteria actually used, however, will depend on what comes out of the preceding steps (both the refined issue statements and the people who commit to participate).
 - c) In a full group meeting, identify tentative products or goals for each of the focal issues. The following standard is proposed for consensus at this preliminary step:

Are participants comfortable enough with a certain goal to try it out for now?

- 4) Opt in or opt out of further participation: Give participants in step 3 the opportunity to commit to detailed work on the focal issues. Continued involvement by contractor(s) should again be reassessed at this point.
- 5) Address focal issues and work toward the tentative products, using the following palette of activities:
 - Conduct joint fact-finding and/or solicit external expertise (e.g., a science advisory board). For example, it may be helpful to conduct a technical exploration of the lead models to answer several questions: How do they work? What are the differences between the two models? What data support the Adult Lead Model? Are the levels they generate protective of human health and the environment?
 - Develop and refine alternatives.
 - Specify criteria for assessment of alternatives.
 - Review alternatives, identify areas of agreement and disagreement.
 - If appropriate, agree upon the content of final products (e.g., specific constructs for revisions in the rule).

It is important that these activities be designed to allow for both highly technical discussions and translation of those discussions and their implications in a more general forum. Small working groups should be used as agreeable to the full group, with decision points held for consideration by the full group.

Finally, funding should be provided to support each of these steps. Concerns about potential bias due to funding sources should be discussed at appropriate points in steps 1, 3, and 5.

APPENDIX A

INTERVIEW PROTOCOL

Background

- What experience have you had with lead-contaminated sites or activities conducted under the GA lead rule?
- What is your background related to this topic? In what ways have you been involved to date?

Explore candidate issues for consideration in subsequent facilitated process:

- What are currently the most important issues in assessment and clean-up of lead-contaminated sites?
- What do you think is at stake in the debate over lead clean-up requirements under GA'S HSRA rules?
- If you could pick one or two things to change in the rule, what would they be?
- What kinds of opposition might you expect to the changes you suggest? Who is likely to raise such opposition?
- Importance of the issues: very little»» great deal. How would you assess the issues you raised in the first question?
- Flexibility on the issues: very little»» great deal. How would you assess the issues you raised in the first question?

Explore levels of information/knowledge about lead-related concerns:

- Are there specific areas where, in your view, more information would help address unresolved issues regarding the lead rule?
- What is the state of today's science regarding lead assessment and clean-up at hazardous sites? In your view, how conclusive or inconclusive is it?

Explore opportunities and obstacles to consider in design of a facilitated process:

- What should be the purpose and product of a facilitated process addressing unresolved issues regarding the lead rule at this point in time?
- What is your prognosis for such a process?
- Who do you think should be involved in such a process? Do you consider yourself a potential participant?
- What conditions would encourage your participation in a facilitated process to address unresolved issues regarding the lead rule?
- What do you see as significant barriers to a facilitated process addressing unresolved issues regarding the lead rule? How might these barriers be overcome?
- What type of forum or arrangements for discussion might help resolve conflicts about assessment and clean-up of lead-contaminated sites?