

GEORGIA INDUSTRY ENVIRONMENTAL COALITION

**GIEC COMMENTS REGARDING
EPD'S "PROPOSED CORRECTIVE ACTION RULE"*
RELATIVE TO THE IMPLEMENTATION OF
THE HAZARDOUS SITE RESPONSE ACT
(HSRA)**

* The proposed rule was issued for public comment on May 24, 1994

I. GENERAL COMMENTS

SECTION 391-3-19-.06(6)(b) - ALL DETERMINATIONS MADE BY THE DIRECTOR SHOULD BE MADE IN WRITING

Throughout the proposed rule and the Act, the Director is empowered to make various far-reaching determinations regarding sites which pose a danger to human health or the environment, and designating those sites as requiring corrective action. The Director also has the responsibility to concur with the Compliance Status Report certification. GIEC believes that the Director has an obligation to make such determinations in writing to all responsible parties.

SECTION 391-3-19-.07 - INCONSISTENCY IN SETTING TARGET RISK LEVELS

The target risk level for Type 1 and Type 3 risk reduction standards is 10^{-5} for Class A and B carcinogens (10^{-4} for Class C carcinogens), as referenced in Sections 391-3-19-.07(6)(c)3 and 391-3-19-.07(8)(d)2.(ii), respectively. However, GIEC believes that reference to a target risk level acceptable for Class C carcinogens has been inadvertently omitted from the Type 2 and Type 4 risk reduction standards proposed in the following sections:

- Section 391-3-19-.07(7)(b)2.;
- Section 391-3-19-.07(7)(c)3.;
- Section 391-3-19-.07(9)(c)2.; and
- Section 391-3-19-.07(9)(d)3.

In addition, EPD proposes under Section 391-3-19-.07(10)(d)1. that the cumulative excess cancer risk for multiple carcinogenic substances and exposure pathways for Type 5 standards shall not be greater than 10^{-5} , which is the same as the target risk level for the individual substances. It makes no sense to have an individual substance target level that is equal to the cumulative level. Under the National Contingency Plan, the cumulative risk level is 10^{-4} . Therefore, GIEC recommends that EPD set the cumulative target risk level for Class A and B carcinogens to 10^{-4} for Type 5 risk reduction standards. GIEC also requests clarification of the applicability of any cumulative target risk level for Class C carcinogens.

SECTION 391-3-19-.07 - APPLICATION OF OTHER METHODOLOGIES AND DATA TO RISK ASSESSMENT

Although U.S. EPA default exposure parameters are currently considered the accepted approach in the development of risk-based preliminary remediation goals, GIEC believes that EPD should expand the proposed language to include other acceptable methodologies and data in the development of corrective action levels, including site-specific exposure parameters, Monte Carlo analysis, and transport modeling.

In addition, the EPD should give consideration to methodologies which may be used to develop relevant toxicity values which are not always available through IRIS, HEAST or ECAO. As examples, toxicity varies significantly for metals of different valence states (such as Cr⁺³ vs Cr⁺⁶), and for different polychlorinated biphenyl compounds having different chlorination levels (e.g., Arochlor 1248 vs Arochlor 1260). GIEC believes that EPD should consider other methodologies due to the vast differences in toxicity factors for some valence states which should be used in developing risk-based preliminary remediation goals.

SECTION 391-3-19-.07(6)(c)1.(i) - NO RISK REDUCTION STANDARD SHOULD BE MORE STRINGENT THAN CRITERIA REQUIRED BY THE RULES FOR NOTIFICATION AND REPORTING

GIEC is encouraged that EPD acknowledges the merits of considering notification concentrations under the Type 1 and Type 3 generic soil criteria. However, GIEC believes that the most stringent soil cleanup criteria for any regulated substance must always be greater than the notification concentration for the same regulated substance under all of the risk reduction standards. As shown in Table 1, attached herein, in no instance is the notification concentration a default value in meeting Type 1 risk reduction standards for the constituents presented. As now proposed, the rule will compel additional and continuing corrective action for some sites already remediated to levels that would no longer even trigger notification and/or reporting.

GLOBAL DIRECTIVES IMPOSED ON RESPONSIBLE PARTIES

In keeping with the clear intent of the Act, a responsible party should be entitled to rebut the implied generic presumption (i.e., not a specific determination) that corrective action is required to meet a risk reduction standard by making a convincing scientific demonstration that the site does not pose a danger to human health or the environment. If such a site poses no danger, it should be removed from the HSI. Finally, arbitrary criteria in the risk reduction standards should be deleted. Specific examples of this include the following:

Essential Features

- **Section 391-3-19-.07(8)(d)**
The 1000 ppm limit for soil vapor.
- **Section 391-3-19-.07(6)(b)**
If more than one regulated organic compound are present in ground water, their sum in a single sample shall not exceed 10 mg/l.

Types 1 and 3 Risk Reduction Standards

- Section 391-3-19-.07(6)(c)1.(ii)
Multiplication of the Type 1 groundwater concentration criteria by a factor of 100.

APPENDIX III

The groundwater criteria presented in Table 1 of Appendix III are based on U.S. EPA Maximum Contaminant Levels (MCLs), health advisories or RCRA-based health levels. The soil criteria are equivalent to the municipal sludge treatment standards for some of the sixteen metal constituents presented in Table 2 of Appendix III. Table 3 of Appendix III presents the parameters, definitions and standard assumptions to be used in the appropriate RAGS equations. The criteria and values presented in these Tables are constantly updated as new toxicological data and information become available. As a result, GIEC strongly suggests that EPD provide language to allow for 1) the adding or deleting of compounds; 2) the amending of criteria provided in Tables 1 and 2 of Appendix III, as appropriate; and 3) the amending of values provided in Table 3 of Appendix III.

II. SPECIFIC COMMENTS:

A. DEFINITIONS

391-3-19-.02(2)(b')

Revise to read -

(b') *Non-residential property* means any real property or portion of a property not currently being used for human habitation or for other purposes with a similar potential for human exposure, at which activities have been or are being conducted *or planned to be conducted* that can be categorized in one of the 1987 Standard Industrial Classification (SIC) major groups 01-97 inclusive (except the four-digit codes 4941, 8051, 8059, 8062-3, 8069, 8211, 8221-2, 8351, 8661, and 9223). Non-residential property includes all of the contiguous block(s) and lot(s) controlled by the same owner or operator that are vacant land, or that are used in conjunction with such business. For leased properties, non-residential property includes the leasehold and any external tank, surface impoundment, septic system, or any other structure, vessel, contrivance, or unit that provides, or is utilized for the management of regulated substances to or from the leasehold.

Rationale - Situations may exist where a property owner has sub-divided their land into parcels zoned for industrial, commercial or other non-residential activities. GIEC is concerned that selected subdivided parcels of land within an area owned by one property owner may never have had any prior applicable SIC code activity as defined under EPD's proposed definition. In this case, the definition of non-residential property excludes properties for which planned SIC code activities have not occurred. As such, these properties potentially deemed as "residential" would not have an opportunity to demonstrate compliance with the Type 3 or Type 4 risk reduction standards.

B. REMOVAL OF SITES FROM THE HAZARDOUS SITE INVENTORY

391-3-19-.05(4)(a)

Revise to read -

(a) The Director determines that it ~~had~~ *does* not ~~had~~ *have* a *reportable* release which either ~~exceeded~~ *exceeds* a reportable quantity or ~~posed~~ *poses* a danger to human health or the environment ~~at the time of listing the site on the Hazardous Site Inventory criteria.~~

Rationale - As proposed in Section 391-3-19-.05(4)(a), a site may be removed from the HSI if the Director determines that the site had not had a release which either exceeds a reportable quantity or poses a danger to human health or the environment at the time of listing the site on the HSI. This basically means that if a site was incorrectly placed on the HSI, then the Director can remove the site from the HSI.

GIEC strongly recommends that EPD allow for additional criteria for removal of a site from the HSI. In particular, a site may well be able to demonstrate through analytical data, interim actions documented in a Compliance Status Report (CSR), or additional site-specific information, that the site does not now exceed HSRA notification concentrations or the criteria for determining a HSRA reportable quantity. Unless otherwise determined by the Director that such a site still poses a danger to human health or the environment, the site should be removed from the HSI.

GIEC recommends that the following language be added as Sections 391-3-19-.05(4)(c) and 391-3-19-.06(6)(b)5. to allow for additional criteria under which a site may be delisted from the HSI.

Add to read -

"If the responsible party demonstrates and certifies that releases at the site do not exceed the notification concentrations of Rule 391-3-19-.04(3) or do not exceed the criteria for determining a reportable quantity of Rule 391-3-19-.05, and the Director concurs with that certification and does not determine that the release poses a danger to human health or the environment, the Director shall remove the site from the Hazardous Site Inventory".

C. CORRECTIVE ACTION

391-3-19-.06(1)

(1) Applicability. The requirements of Rule 391-3-19-.06 apply to any person who is a responsible party at a site listed on the Hazardous Site Inventory except as otherwise provided for in Rule 391-3-19-.06(7).

Comment - From the onset of the HSRA rulemaking process, the EPD Director stated that it was his intention to apply HSRA corrective action technical requirements to solid waste management units (SWMUs) for corrective action under RCRA. GIEC believes that Type 1 through Type 5 risk reduction standards should be made available as SWMU corrective action criteria at RCRA-regulated facilities within the proposed rule to the extent such application is not prohibited by Federal law and regulation. GIEC requests that EPD now reiterate this previously declared intention.

391-3-19-.06(2)(a)2.

Revise to read -

2. Has had a release *discrete source* which that continues to add contaminants *release additional regulated substances* to soil, water, or air, *the environment*, or has a release that continues to ~~expand in area or volume~~ *increase in regulated substance mass*;

Rationale - Regulated substances present in the environment will naturally migrate over time, and thereby "expand in area or volume". With the proposed language, GIEC believes that it would be very difficult, if not impossible, to prove that any release was not continuing to expand in area and/or volume, or that a soil release was not continuing to "add contaminants" to water and/or air. GIEC understands that EPD only intends this provision to mean those sites where an uncontrolled discrete source of regulated substances (not yet released to the environment) is actually continuing to release an additional mass of regulated substances into the environment. GIEC recommends the above alternate language be adopted. If the above alternate language is not adopted, GIEC requests written clarification of EPD's interpretation and intent with regard to this criterion for designation of Class I sites.

391-3-19-.06(2)(a)6.

Revise to read -

6. Does not meet any other criteria of Rule 391-3-19-.06(2)(a) but the Director has *evaluated relevant risk factors and* determined that it nevertheless poses a danger to human health or the environment.

Rationale - The Director is specifically empowered under the Act to determine whether a site poses a present or future danger to human health or the environment. Therefore, the Director needs criteria available to make that determination. GIEC believes that the Director must consider relevant risk factors to support his determination and minimize any arbitrary decision-making process that is not supported by a danger-based approach.

D. COMPLIANCE STATUS REPORT

391-3-19-.06(3)(b)2.

Revise to read -

2. If a release involves soil contamination, a complete definition of the horizontal and vertical extent of such soil contamination. Satisfactory evidence of a complete definition of the horizontal and vertical extent of soil contamination shall consist of an appropriate number of data points at sufficient locations with concentrations at background concentrations. An acceptable determination of background concentrations shall be made from samples that are representative of soil conditions not affected by a release *exceeding a reportable quantity* of a regulated substance. In support of the definition of the extent of soil contamination the compliance report shall describe the following:

Rationale - Various site situations may exist in which complete delineation to background concentrations is not technically feasible or is hindered by site characteristics. Background concentrations for naturally occurring substances may vary with lithology depending on the geology of the site, and would be difficult and very expensive to define. GIEC believes that EPD intends for the determination of an appropriate number of data points to be in accordance with the statistical procedures referenced in Section 391-3-19-.06(3)(b)2.(v).

For a developed industrial site where raw materials may have been widely used and permitted environmental emissions containing a regulated substance may be detected across the site, it is GIEC's position that it would be unreasonable and unnecessary to fully map all concentrations down to background that is "not affected by a release of a regulated substance". The problem with this proposed requirement is that the mere presence of a regulated substance would seemingly be considered evidence of "a release". GIEC recommends that "a release" be limited to those exceeding a reportable quantity.

Alternatively, the extent could be acceptably defined using notification concentrations as the extent-defining limit in soils. There is little or no practical benefit in chasing concentrations below soil notification concentrations. Further, the economic burden in doing so would represent a significant waste of resources.

391-3-19-.06(3)(b)3.

Revise to read -

3. If a release involves groundwater contamination, a complete definition of the horizontal and vertical extent of groundwater contamination. Satisfactory definition of the horizontal and vertical extent of groundwater contamination shall consist of an appropriate number of data points at sufficient locations with concentrations at background concentrations. An acceptable determination of background concentrations shall be made from samples that are representative of groundwater conditions not affected by a release *exceeding a reportable quantity* of a regulated substance. The compliance status report shall, at a minimum, describe the following:

Rationale - Various site situations may exist in which complete delineation to background concentrations is not technically feasible or is hindered by site characteristics. Background concentrations for naturally occurring substances in groundwater may vary with lithology depending on the geology of the site, and would be difficult and very expensive to define. GIEC believes that EPD intends for the determination of an appropriate number of data points to be in accordance with the procedures referenced in Section 391-3-19-.06(3)(b)3.(vii).

For a developed industrial site where raw materials may have been widely used and permitted environmental emissions containing a regulated substance may be detected across the site, it is GIEC's position that it would be unreasonable and unnecessary to fully map all concentrations in groundwater down to background that is "not affected by a release of a regulated substance". The problem with this proposed requirement is that the mere presence of a regulated substance would seemingly be considered evidence of "a release". GIEC recommends that "a release" be limited to those exceeding a reportable quantity.

Alternatively, the extent in groundwater would be adequately determined by using Table 1 of Appendix III ("drinking water") levels. The proposed requirement to define the horizontal and vertical extent of groundwater concentrations to background levels (which are detection limits for most organic compounds) would go beyond the intent of the Act. There is little or no practical benefit in chasing concentrations below safe drinking-water levels. Further, the economic burden in doing so would represent a significant waste of resources.

391-3-19-.06(3)(b)8. and 9.

Revise to read -

8. If the responsible party certifies pursuant to Rule 391-3-19-.06(4)(c) *and the Director concurs in writing* that the site is not in compliance with any of the risk reduction standards of Rule 391-3-19-.07, the compliance status report may include a proposed corrective action plan that describes the corrective action that the responsible party has determined is necessary to achieve compliance with the applicable risk reduction standards of Rule 391-3-19-.07.

9. If the responsible party certifies pursuant to Rule 391-3-19-.06(4)(c) *and the Director concurs in writing* that the site is in compliance with the Type 3, Type 4 or Type 5 risk reduction standards of Rule 391-3-19-.07, the compliance status report may include a proposed corrective action plan that describes the continuing actions that the responsible party has determined are necessary to ~~achieve or maintain compliance~~ *comply* with the Type 3, Type 4 or Type 5 risk reduction standards.

Add to read -

11. Owners may receive a variance from the Director if the owner can demonstrate to the satisfaction of the Director that certain requirements are not applicable or relevant to a determination of whether corrective action is needed at the particular site.

Rationale - The Director also has the responsibility to concur with the compliance status report certification. GIEC believes that the Director has an obligation to make such determination in writing to all responsible parties. Finally, if the responsible party certifies that the site is in compliance with Type 3, Type 4, or Type 5 risk reduction standards and the Director concurs, corrective action is not required to achieve the risk reduction standards.

E. PUBLIC PARTICIPATION

391-3-19.06(5)(a)2.

Revise to read -

"2. The following statement: *"The Georgia Environmental Protection Division, Department of Natural Resources, State of Georgia (EPD) has placed this site on the Hazardous Site Inventory pursuant to its authority under the Hazardous Site Response Act and Rules promulgated thereunder. As required by the Rules for Hazardous Site Response, the responsible party for this site was required to investigate the site and submit a compliance status report to EPD summarizing the results of that investigation. EPD is currently reviewing the compliance status report to determine if corrective action is needed for regulated substances that have been released at this site for a release exceeding a reportable quantity of a regulated substance. Before EPD decides whether corrective action is needed, the public has the opportunity to review the compliance status report and provide comments to EPD about the report."*

Rationale - In keeping with the intent of the proposed corrective action rules, GIEC requests that EPD provide language that is explicitly clear that the compliance status report is applicable to the release exceeding a reportable quantity of a regulated substance.

391-3-19-.06(5)(f)

Revise to read -

(f) Upon making a determination pursuant to Rule 391-3-19-.06(6) or upon *the Director* determining that a proposed corrective action plan should be approved, the Director shall publish notice of such determination in a major local newspaper of general circulation and the legal organ of the local governments in whose jurisdiction the site is located.

Rationale - In keeping with the duties empowered to the Director, under O.C.G.A. § 12-8-94 and § 12-8-96, GIEC requests that the Director be identified as the person who is obligated to make a determination

F. DETERMINATION OF THE NEED FOR CORRECTIVE ACTION

391-3-19-.06(6)(a)

Revise to read -

(a) *For any site or individual property at a site that is classified on the Hazardous Site Inventory as Class I, Class III or Class IV pursuant to Rule 391-3-19-.06(2), shall also be designated by the Director as having a known release needing corrective action. the Director shall make a determination that the site poses a danger to human health or the environment and designate the site as needing corrective action.*

Rationale - Throughout Section 391-3-19-.06(6), wherever it is stated that the Director shall designate or make a determination that corrective action is needed, the phrase should be revised to include language, such as that provided above.

391-3-19-.06(6)(b)(2)

Revise to read -

2. If the responsible party certifies that the site or an individual property at the site is in compliance with the Type 3 or Type 4 risk reduction standards of Rule 391-3-19-.07, and the Director concurs with that certification, the Director shall designate the site or property on the Hazardous Site Inventory as having a known release ~~needing corrective action~~, reclassify it as Class III, and state on the Inventory that corrective action shall presently consist of those activities needed to maintain compliance with the Type 3 or Type 4 risk reduction standards, including the property notices of Rule 391-3-19-.08(1) and (2). Upon compliance with Rule 391-3-19-.08(4), the Director shall remove the site or property from the Hazardous Site Inventory in accordance with Rule 391-3-19-.05(4).

Rationale - The proposed language implies that a site in compliance with Type 3 or Type 4 risk reduction standards will need corrective action. In some instances, a site in compliance with Type 3 or Type 4 risk reduction standards may require no corrective action. GIEC recommends deleting the phrase "needing corrective action" to eliminate the ambiguity of the sentence.

391-3-19-.06(6)(d)

Revise to read -

(d) Upon making a determination *that the site is Class I and* pursuant to Rule 391-3-19-.06(6)(a)-(c) that the site has a known release *exceeding a reportable quantity and* needing corrective action, the Director shall provide the responsible party, and the owner of each property at the site which continues not to comply with either Type 1 or Type 2 risk reduction standards of Rule 391-3-19-.07, with written notice of such determination, including a statement concerning the requirements of Rule 391-3-19-.08.

Rationale - In accordance with O.C.G.A. § 12-8-96(a), the Director shall make a reasonable effort to identify each person who has contributed or who is contributing to such a release. The Act goes on to state that the Director shall then notify each such person in writing of the opportunity to perform voluntary corrective action, or may direct corrective action under an order. GIEC requests that a time period be specified under Section 391-3-19-.06(6)(d), in which the Director is required to notify all responsible parties. GIEC supports immediate notification by the Director, or as soon as practical, within a specified time period to allow responsible parties adequate time to negotiate or form alliances with other responsible parties involved in the same reportable release site. GIEC proposes that the following language be considered by the EPD in the Director's notification to all responsible parties.

" The Georgia Environmental Protection Division (EPD) has received information suggesting that the parties to whom this letter is addressed may, among others, be potentially responsible parties at the subject site that has been listed on the Hazardous Site Inventory pursuant to Rule 391-3-19-.05(1).

EPD has not yet determined the responsibility of these parties or any other yet unnamed parties for any actions and associated costs and penalties that may be incurred in addressing this site. Nonetheless, we want to let you know now that if you are found to be a responsible party you will be responsible for all or a part of such actions, costs and/or penalties. You may wish to contact the other identified parties to further discuss your mutual interests regarding this site.

On (date), EPD Director intends to require that the current owner of the property undertake the preparation and certification of the Compliance Status Report and submit the report and certification to the EPD Director by (date)."

G. COMPLETION OF CORRECTIVE ACTION

391-3-19-.07(3)

Revise to read -

A required corrective action shall be considered complete when it is demonstrated that the site or individual property at a site meets any or a combination of the applicable risk reduction standards described in Rule 391-3-19-.07 *or that the release exceeding a reportable quantity no longer exists*. All risk reduction standards will, when adequately carried out, assure adequate protection of human health and the environment from potential exposure to land-based *releases exceeding a reportable quantity* of regulated substances.

Rationale - GIEC contends that if a responsible party is able to demonstrate that the site no longer exceeds the notification concentrations, or the criteria for determining a reportable quantity, then (unless otherwise determined by the Director) the site should be removed from the HSI.

391-3-19-.07(4)(b)

Revise to read -

(b) No soil remaining in place under Type 1, 2, 3, or 4 risk reduction standards shall exhibit the hazardous waste characteristics of ignitability, corrosivity, or reactivity as defined in 40 CFR 261 Subpart C. ~~and the sum of regulated substance concentrations in air filled soil pore space shall not exceed 1000 parts per million (by weight or volume) as determined using methods approved by the Director.~~

Rationale - Under Section 391-3-19-.07(4)(b), the proposed criterion "air-filled soil pore space shall not exceed the 1000 parts per million (by weight or volume)" has no rationale (nor in the Texas rule from which it was apparently copied) that connects the requirement to any HSRA danger-based criteria and therefore overreaches the Act itself. The proposed regulations amply address inhalation exposure for soil volatiles under (d)(3) of this section and the proposed vapor sum limit is redundant and a costly criterion to evaluate without yielding a significant additional benefit. Soil air concentrations represent the concentrations of contaminants in the pore space of soil and in no way represent ambient air concentrations. Additionally, soil air concentrations are not potential exposure concentrations. As this standard is not relevant with respect to actual or potential human health exposures, it should be removed from the proposed rule.

391-3-19-.07(4)(c)

Comment: HSRA references environmental and foodchain impacts as additional criteria which should be considered during demonstration of compliance with corrective action, but does not provide guidance concerning how environmental concerns should be addressed in order to demonstrate compliance with HSRA.

H. CRITERIA FOR TYPE 1 STANDARDS.

391-3-19-.07(6) through (9):

Comment: Throughout these sections, reference is made to concentrations "at any point" which should not exceed a specific guideline. These statements infer that the maximum detected concentration should be used as the exposure point concentration in the evaluation of compliance with the risk-reduction standards. RAGS Part A supports the use of the 95th upper confidence limit of the arithmetic mean as the appropriate measure for a "reasonable maximum exposure" concentration. A point-by point comparison of detected groundwater or soil concentrations is overly conservative and may force sites into corrective action when the extent of contamination does not warrant such action.

391-3-19-.07(6)(b)

Revise to read -

(b) Criteria for ground water. At any point within ground water that has been affected by a release, concentrations of regulated substances in groundwater samples shall not exceed concentrations given in Table 1 of Appendix III or, for those *regulated* substances not listed, the background, or detection limit concentration, *or a concentration approved by the Director*. ~~If more than one regulated organic compounds are present in ground water, their sum in a single sample shall not exceed 10 mg/L if the Table 1 value for each compound is less than 5 mg/L, or, where at least one compound has a Table 1 value greater than or equal to 5 mg/L, the sum of the concentrations shall not exceed the maximum Table 1 value for a detected compound plus 10 mg/L.~~

Rationale - It is important that the evaluation and regulation of metals in a groundwater sample distinguish those metals that are actually dissolved from those metals that are present (sorbed) on particulate matter that may be contained in a groundwater (monitoring well) sample. It is common to find that monitoring wells will contain suspended matter from the natural soil formation that is a relic of the well installation, and not indicative of actual groundwater quality in the aquifer. This is particularly the case for low yield monitoring wells installed in fine-grained soil formations. GIEC recommends that a footnote be added to Table 1 of Appendix III denoting that the corrective action criteria for metals in groundwater be based on the dissolved state of the regulated substance.

The proposed rules should allow for additional criteria other than background or the detection limit for those regulated substances in ground water and not listed in Table 1 of Appendix III in meeting Type 1 standards. GIEC suggests that any alternate concentrations approved by the Director should be an acceptable option under Type 1 standards.

In reference to the last sentence of this Section, there is no scientific basis for this arbitrary requirement and no connection whatsoever to the requisite danger-based trigger in the Act.

3913-19-.07(6)(c)2. and 3.

Revise to read -

2. For all surficial soils and other subsurface soils where direct human exposure is not effectively precluded, concentrations which are unlikely to result in any noncancer toxic effects on human health via soil ingestion along with inhalation of volatiles and particulates, determined using Equation 7 of RAGS, Part B, and standard residential exposure assumptions in Table 3 of Appendix III or published, scientifically-based, peer-reviewed methods and applicable exposure assumptions acceptable to the Director.

3. For all surficial soils and other subsurface soils where direct human exposure is not effectively precluded, concentrations for which the upper bound on the estimated excess cancer risk is less than or equal to 10^{-5} (10^{-4} for Class C carcinogens) via soil ingestion along with inhalation of volatiles and particulates, determined using Equation 6 of RAGS, Part B, and standard residential exposure assumptions in Table 3 of Appendix III or published, scientifically-based, peer-reviewed methods and applicable exposure assumptions acceptable to the Director.

Rationale - As for soil criteria designed to be protective of direct ingestion and inhalation, the only soils that should be subject to such requirements are those where such direct exposure potential is a plausible presumption. EPD's blanket presumption, that all soil (at any depth or under any structure) may one day be surficial soil to which humans are continuously and directly exposed, is excessive. If a responsible party makes a reasonable demonstration that soils are not subject to direct contact, now or in the future, such inaccessible soils should not be subject to the requirements applied to surficial soils in residential yards. In the same fashion, if infiltration is permanently excluded from a soil, the leaching scenario is simply not applicable and the soil criteria are excessive.

The RAGS equations are used to establish concentrations at which a potential receptor may be exposed to a certain risk. For all practical purposes, direct human health exposure is based on surficial soils. GIEC suggests that EPD consider the limited application of a site-specific risk assessment proposed under each risk reduction standard. Although RAGS is currently considered the U.S. EPA accepted approach to risk assessment applications, GIEC believes that EPD should expand the proposed language to include other acceptable methodologies, including site-specific exposure factors in evaluating whether a site can meet a risk reduction standard.

I. CRITERIA FOR TYPE 2 STANDARDS

391-3-19-.07(7)(b)1. and 2.

Revise to read -

1. Concentrations which are unlikely to result in any noncancer toxic effects on human health via ingestion of, and inhalation of volatiles, from ground water, determined using Equation 2 from RAGS, Part B, and site-specific exposure factors for the residential use scenario *or published, scientifically-based, peer-reviewed methods and applicable exposure assumptions acceptable by the Director.*
2. Concentrations for which the upper bound on the estimated excess cancer risk is less than *or equal to* 10^{-5} (10^{-4} for Class C carcinogens) via ingestion of, and inhalation of volatiles from ground water, determined using Equation 1 from RAGS, Part B, and site-specific exposure factors for the residential use scenario *or published, scientifically-based, peer-reviewed methods and applicable exposure assumptions acceptable by the Director.*

Rationale - The RAGS equations are used to establish concentrations at which a potential receptor may be exposed to a certain risk. For all practical purposes, direct human health exposure is based on surficial soils. GIEC suggests that EPD consider the limited application of a site-specific risk assessment proposed under each risk reduction standard. Although RAGS is currently considered the U.S. EPA accepted approach to risk assessment applications, GIEC believes that EPD should expand the proposed language to include other acceptable methodologies, including site-specific exposure factors in evaluating whether a site can meet a risk reduction standard.

The target risk level for Type 1 and Type 3 risk reduction standards is 10^{-5} for Class A and B carcinogens (10^{-4} for Class C carcinogens), as referenced in Sections 391-3-19-.07(6)(c)3 and 391-3-19-.07(8)(d)2.(ii), respectively. However, GIEC believes that reference to a target risk level acceptable for Class C carcinogens has been inadvertently omitted from the Type 2 and Type 4 risk reduction standards.

391-3-19-.07(7)(c)2. and 3.

Revise to read -

2. For all surficial soils and other subsurface soils where direct human exposure is not effectively precluded, concentrations which are unlikely to result in any noncancer toxic effects on human health via soil ingestion along with inhalation of volatiles and particulates, determined using Equation 7 from RAGS, Part B, and site-specific exposure factors for the residential use scenario **or published, scientifically-based, peer-reviewed methods and applicable exposure assumptions acceptable by the Director.**

3. For all surficial soils and other subsurface soils where direct human exposure is not effectively precluded, concentrations for which the upper bound on the estimated excess cancer risk is less than **or equal to** 10^{-5} (10^{-4} for Class C carcinogens) via soil ingestion along with inhalation of volatiles and particulates, determined using Equation 6 from RAGS, Part B, and site-specific exposure factors for the residential use scenario **or published, scientifically-based, peer-reviewed methods and applicable exposure assumptions acceptable by the Director.**

Rationale - As for soil criteria designed to be protective of direct ingestion and inhalation, the only soils that should be subject to such requirements are those where such direct exposure potential is a plausible presumption. EPD's blanket presumption, that all soil (at any depth or under any structure) may one day be surficial soil to which humans are continuously and directly exposed, is excessive. If a responsible party makes a reasonable demonstration that soils are not subject to direct contact, now or in the future, such inaccessible soils should not be subject to the requirements applied to surficial soils in residential yards. In the same fashion, if infiltration is permanently excluded from a soil, the leaching scenario is simply not applicable and the soil criteria for protection of groundwater are excessive.

The RAGS equations are used to establish concentrations at which a potential receptor may be exposed to a certain risk. For all practical purposes, direct human health exposure is based on surficial soils. GIEC suggests that EPD consider the limited application of a site-specific risk assessment proposed under each risk reduction standard. Although RAGS is currently considered the U.S. EPA accepted approach to risk assessment applications, GIEC believes that EPD should expand the proposed language to include other acceptable methodologies, including site-specific exposure factors in evaluating whether a site can meet a risk reduction standard.

The target risk level for Type 1 and Type 3 risk reduction standards is 10^{-5} for Class A and B carcinogens (10^{-4} for Class C carcinogens), as referenced in Sections 391-3-19-.07(6)(c)3 and 391-3-19-.07(8)(d)2.(ii), respectively. However, GIEC believes that reference to a target risk level acceptable for Class C carcinogens has been inadvertently omitted from the Type 2 and Type 4 risk reduction standards.

391-3-19-.07(7)(e)

Revise to read -

(e) ~~More stringent~~ *Alternative* criteria may be established for a site than are specified under Rule 391-3-19-.07(7)(b) and (c) *if in those specific instances where* the Director or the responsible party determines that it is ~~necessary to protect~~ *protective of* human health or the environment.

Rationale - GIEC assumes that EPD added this criteria to the Type 2 standards to allow flexibility in dealing with site-specific instances where the exposure scenarios provided in the proposed rule are not appropriate. GIEC recommends that in some cases, less stringent (in addition to "more stringent") criteria, as approved by the Director, should be provided in these rules. GIEC therefore suggests that the above language be adopted.

J. CRITERIA FOR TYPE 3 STANDARDS.

391-3-19-.07(8)(d)1.

Revise to read -

1. Concentrations at any point above the uppermost groundwater zone *and in the unsaturated* soil that has been affected by the release shall not exceed the higher of concentrations described in Item 1 of Rule 391-3-19-.07(6)(c) or those listed in Table 2 of Appendix III.

Rationale - GIEC believes that the soil criteria should only apply to unsaturated soil, or to the vadose zone. It is extremely difficult, if not impossible, to differentiate between constituents associated with the soil and the groundwater in the saturated zone. GIEC therefore, recommends that the proposed language reference the "unsaturated" soil under Type 3 criteria.

391-3-19-.07(8)(d)2.

Revise to read -

2. Concentrations in surface soil (soil within 2 feet of the land surface) shall not exceed the lower of the concentrations defined in Items (i) and (ii) below. If neither of the calculations implied below can be made, the surface soil criteria shall be equal to the criterion of Item 1 above. ~~In no event shall~~ *With the Director's approval*, compliance with the surface soil criteria *may* be achieved by applying two feet of clean soil onto the original land surface.

Rationale - As provided in the Texas rules, GIEC strongly recommends that EPD reconsider the application of two feet of clean soil as an option in meeting the Type 3 risk reduction standard criteria. In some instances depending on the intended land use of the site, applying two feet of clean soil may sufficiently minimize or eliminate direct human exposure, and prevent migration of regulated substances to ground water.

391-3-19-.07(8)(d)2.(i) and (ii)

Revise to read -

(i) Concentrations which are unlikely to result in any noncancer toxic effects on human health due to ingestion of soil and inhalation of particulates and volatiles, determined using Equation 7 of RAGS, Part B, and standard nonresidential exposure assumptions in Table 3 of Appendix III, *or acceptable published methods and site-specific exposure factors for calculating acceptable concentrations.*

(ii) Concentrations for which the upper bound on the estimated excess cancer risk is less than or equal to 10^{-5} (10^{-4} for Class C carcinogens) for human ingestion of soil and inhalation of particulates and volatiles, determined using Equation 6, RAGS, Part B, and standard nonresidential exposure assumptions in Table 3 of Appendix III, *or acceptable published methods and site-specific exposure factors for calculating acceptable concentrations.*

Rationale - Again, although RAGS is currently considered the U.S. EPA accepted approach to risk assessment applications, GIEC believes that EPD should expand the proposed language to include other acceptable methodologies, including site-specific exposure factors in evaluating whether a site can meet a risk reduction standard.

K. CRITERIA FOR TYPE 4 STANDARDS.

391-3-19-.07(9)(c)

Revise to read -

(c) Criteria for ground water. Concentrations of regulated substances in groundwater samples must not exceed, at any point within the ~~property~~ *affected site* boundaries, the lesser of the values from Items 1 and 2 below or, for those substances for which neither calculation can be made, the higher of concentrations in Table 1 of Appendix III, background concentrations, or detection limit concentrations.

Rationale - It is important that the evaluation and regulation of metals in a groundwater sample distinguish those metals that are actually dissolved from those metals that are present (sorbed) on particulate matter that may be contained in a groundwater (monitoring well) sample. It is common to find that monitoring wells will contain suspended matter from the natural soil formation that is a relic of the well installation, and not indicative of actual groundwater quality in the aquifer. This is particularly the case for low yield monitoring wells installed in fine-grained soil formations. Further, the drinking water criteria for metals in Table 1 are taken from criteria applicable for a drinking water distribution system which contains a significant amount of particulate matter. Also, the toxic effects of metals in drinking water are associated with the bioavailability of the metal. GIEC recommends that a footnote be added to Table 1 of Appendix III denoting that the corrective action criteria for metals in groundwater be based on the dissolved state of the regulated substance.

GIEC believes it is not appropriate to apply Type 4 risk reduction standards for ground water to the entire property, but only to the site affected by a reportable release of a regulated substance, consistent with the other risk reduction standards.

391-3-19-.07(9)(c)1. and 2.

Revise to read -

1. Concentrations which are unlikely to result in any noncancer toxic effects on human health via ingestion of, and inhalation of volatiles, from ground water, determined using Equation 2 from RAGS, Part B, and site-specific exposure factors for the residential use scenario *or published, scientifically-based, peer-reviewed methods and applicable exposure assumptions acceptable by the Director.*
2. Concentrations for which the upper bound on the estimated excess cancer risk is less *or equal to* than 10^{-5} (10^{-4} for Class C carcinogens) via ingestion of, and inhalation of volatiles from ground water, determined using Equation 1 from RAGS, Part B, and the site-specific exposure factors for the non-residential use scenario *or acceptable published methods and site-specific exposure factors for calculating acceptable concentrations.*

Rationale - The target risk level for Type 1 and Type 3 risk reduction standards is 10^{-5} for Class A and B carcinogens (10^{-4} for Class C carcinogens), as referenced in Sections 391-3-19-.07(6)(c)3 and 391-3-19-.07(8)(d)2.(ii), respectively. However, GIEC believes that reference to a target risk level acceptable for Class C carcinogens has been inadvertently omitted from the Type 4 and Type 2 risk reduction standards.

Again, although RAGS is currently considered the U.S. EPA accepted approach to risk assessment applications, GIEC believes that EPD should expand the proposed language to include other acceptable methodologies, including site-specific exposure factors in evaluating whether a site can meet a risk reduction standard.

391-3-19-.07(9)(d)

Revise to read -

- (d) Criteria for soil. Concentrations at any points above the uppermost groundwater zone in soil that has been affected by the release shall not exceed the least of the concentrations in Items 1-3 below, or, for those substances for which said concentrations cannot be calculated, the highest of concentrations in Table 2 of Appendix III, background concentrations, or detection limit concentrations:

1. ***For all soils***, concentrations which will not cause contamination of ground water at levels which exceed Type 4 groundwater concentration criteria, as determined by any laboratory test and/or fate-and-transport model recognized by USEPA and approved by the Director, at a point of exposure defined as any point at which a drinking water well could be installed.

2. ***For all surficial soils and other soils where direct human exposure is not effectively precluded***, concentrations which are unlikely to result in any noncancer toxic effects on human health via soil ingestion along with inhalation of volatiles and particulates, determined using Equation 7 from RAGS, Part B, and site-specific exposure factors for the non-residential use scenario ***or published, scientifically-based, peer-reviewed methods and applicable exposure assumptions acceptable by the Director.***

3. ***For all surficial soils and other soils where direct human exposure is not effectively precluded***, concentrations for which the upper bound on the estimated excess cancer risk is less than ***or equal to*** 10^{-5} (10^{-4} for Class C carcinogens) via soil ingestion along with inhalation of volatiles and particulates, determined using Equation 6 from RAGS, Part B, and site-specific exposure factors for the non-residential use scenario ***or published, scientifically-based, peer-reviewed methods and applicable exposure assumptions acceptable by the Director.***

Rationale - Again, GIEC suggests that the Director distinguish between the application of the Type 4 generic soil criteria to all soil versus surficial soil.

In addition, the target risk level for Type 1 and Type 3 risk reduction standards is 10^{-5} for Class A and B carcinogens (10^{-4} for Class C carcinogens), as referenced in Sections 391-3-19-.07(6)(c)3 and 391-3-19-.07(8)(d)2.(ii), respectively. However, GIEC believes that reference to a target risk level acceptable for Class C carcinogens has been inadvertently omitted from the Type 2 and Type 4 risk reduction standards.

Again, although RAGS is currently considered the U.S. EPA accepted approach to risk assessment applications, GIEC believes that EPD should expand the proposed language to include other acceptable methodologies, including site-specific exposure factors in evaluating whether a site can meet a risk reduction standard.

391-3-19-.07(9)(f)

Revise to read -

(f) ~~More stringent~~ *Alternative* criteria may be established for a site than are specified under Rule 391-3-19-.07(7)(9)(c) and (d) ~~if in those specific instances where~~ the Director or the responsible party determines that it is ~~necessary to protect~~ *protective of* human health or the environment.

Rationale - GIEC assumes that EPD added this criteria to the Type 4 standard to allow flexibility in dealing with site-specific instances where the exposure scenarios provided in the proposed rule are not appropriate. GIEC recommends that in some cases, less stringent in addition to "more stringent" criteria as approved by the Director should be provided in these rules. GIEC therefore suggests that the above language be adopted.

L. CRITERIA FOR TYPE 5 STANDARDS

391-3-19-.07(10)(a)

Revise to read -

(a) Type 5 standards allow, in those instances where application of Type 1-4 standards is not appropriate under present circumstances, the use of measures to control the regulated substances ~~or on~~ the property where the regulated substances are located. Such measures may consist of engineering controls ~~such as construction of a fence, placement of a cap, installation of a slurry wall, or stabilization/ solidification/ fixation of the waste or waste residues,~~ *natural controls, or institutional controls*. Under Type 5 standards, removal, decontamination or treatment are used where appropriate to ~~remove~~ *abate* the principal threats at a site. The responsible party has the burden of being able to demonstrate to the satisfaction of the Director that the particular ~~mix of removal, decontamination, treatment, and/or control~~ measures are appropriate to eliminate or abate present and future threats to human health and the environment. Institutional controls should not be substituted for ~~active remedial~~ *other* measures unless such ~~active~~ *other* measures are determined not to be practicable.

Sentence-by-Sentence Discussion

Sentence 1 *"Type 5 standards allow, in those instances where application of Type 1-4 standards is not appropriate under present circumstances, the use of measures to control the regulated substances on the property where the regulated substances are located".*

Comment - GIEC commends EPD for allowing Type 5 standards to be on equal footing with Type 1 through 4 risk reduction standards.

Sentence 2 *"Such measures may consist of engineering controls, natural controls, or institutional controls".*

Rationale - GIEC believes that all measures are available and should be considered in addressing the release of a regulated substance.

Sentence 3 *"Under Type 5 standards, removal, decontamination or treatment are used, where appropriate to abate the principal threats at a site".*

Comment - The basic principles of this sentence have not changed with regard to addressing the immediate threats at a site. GIEC believes that the proposed statement addresses EPD concerns.

Sentence 4 *"The responsible party has the burden of being able to demonstrate to the satisfaction of the Director that the particular measures are appropriate to eliminate or abate present and future threats to human health and the environment".*

Rationale - GIEC commends EPD in providing language which now allows "appropriate" measures to be considered. However, language in the rules do not need to specify that a "mix of removal, decontamination, treatment and/or control measures" is appropriate, when, in fact, one such measure alone may be adequate.

Sentence 5 *"Institutional controls should not be substituted for other measures, unless such other measures are determined not to be practicable."*

Rationale - All other methods are not "active remedial" measures.

391-3-19-.07(10)(d)1.

Revise to read -

1. Carcinogens. For carcinogens, the measures shall be expected to permanently prevent exposures which exceed the upper bound on an estimated excess cancer risk of 10^{-5} (10^{-4} for Class C carcinogens) for individual carcinogenic substances and individual exposure pathways. The cumulative excess cancer risk for multiple carcinogenic substances and exposure pathways shall not be greater than 10^{-5} 10^{-4} .

Rationale - EPD proposes that the cumulative excess cancer risk for multiple carcinogenic substances and exposure pathways shall not be greater than 10^{-5} , which is the same as the target risk level for the individual substances. It makes no sense to have an individual substance target level that is equal to the cumulative level. Under the National Contingency Plan, the cumulative risk level is 10^{-4} . Therefore, GIEC recommends that EPD set the cumulative target risk level for carcinogens at 10^{-4} for Type 5 risk reduction standards. GIEC also requests clarification of the applicability of any cumulative target risk level for Class C carcinogens.

391-3-19-.07(10)(d)2.

Revise to read -

2. Systemic toxicants. For systemic toxicants, the measures shall be expected to permanently prevent exposures which exceed the dose to which the human population (including sensitive subgroups) could be exposed on a daily basis without appreciable risk of deleterious effect during a lifetime. Exposures shall not exceed a hazard quotient of one or a *cumulative* hazard index ~~of one~~ ranging from 1 to 10. The hazard quotient is the ratio of a single systemic toxicant exposure level for a specified time period to a reference dose for that systemic toxicant derived from the same time period. The hazard index is the sum of the hazard quotients for a single or multiple systemic toxicants which affect the same target organ, or which act by the same method of toxicity through single or multiple media exposure pathways.

Rationale - The proposed rules specifies "that exposure shall not exceed a ... hazard index of one". This criteria is accepted by the U.S. EPA for residential exposure scenarios. The U.S. EPA accepts a cumulative hazard index value ranging from 1 for residential exposure scenarios, to a hazard index value of 10 for industrial exposure scenarios. GIEC believes that a residential scenario hazard index of one is overly conservative for application to Type 5 criteria standards. GIEC recommends that at the discretion of the Director, a cumulative hazard index ranging from one to ten be used.

391-3-19-.07(10)(d)4.

Revise to read -

4. Ground Water. The measures shall be expected to permanently assure that groundwater concentrations shall not exceed Type 1-4 criteria, as applicable. The applicable groundwater criterion shall be achieved throughout the entire plume of contaminated ground water, except where the remedial measure provides for soil being left in place with concentrations in excess of applicable soil criteria under Types 1-4, in which case the Director may exclude from this requirement that portion of the plume that lies directly under the contaminated soil, ~~as long as continuing releases to ground water from the soil and continued vertical migration of the release within~~ *where* ground water ~~are eliminated~~ *is effectively controlled* by approved control measures. At a minimum, for all Type 5 cases, free product shall be removed to the extent practicable.

Rationale - A continuing "source" which adds additional contaminants to ground water from the soil and possibly allows continued vertical migration of the release should be "eliminated". GIEC believes that as long as a continuing "release" is effectively controlled or precluded by control measures, a danger to human health or the environment does not exist.

391-3-19-.07(10)(d)5.

Revise to read -

5. Soil. The measures shall not leave, beyond the effective control of ~~engineering control~~ *such* measures, concentrations of regulated substances in soil that exceed the soil criteria for Type 1-4 standards, as applicable.

Rationale - GIEC believes that the Type 5 performance criteria should not be limited solely to the engineering control measures. Other measures can provide the same or similar effectiveness in meeting the appropriate criteria. GIEC therefore, suggests that in addition to engineering controls, EPD should also consider natural controls and institutional controls in meeting Type 5 standards.

M. PROPERTY NOTICES

391-3-19-.08(1)

Revise to read -

(1) Notices to private property instruments. This Rule *paragraph* applies to ~~the owner of any property that is included in a site which is listed on the Hazardous Site Inventory and which has been designated a site for which the Director has made a determination that the site poses a danger to human health or the environment and thus, as needing~~ requiring corrective action pursuant to Rule 391-3-19-.06(6). The requirements of this paragraph do not apply to the owner of any property at the site where the Director concurs with a demonstration that the property complies, independently of other properties at the site, with either Type 1 or Type 2 risk reduction standards.

Rationale - The listing of a site on the Hazardous Site Inventory does not have any direct bearing on whether a notice is deemed necessary for a property. However, GIEC does acknowledge the necessity to place notices on private property instruments for sites which the Director has determined pose a danger to human health or the environment, and require corrective action. GIEC offers the proposed language noted above.

391-3-19-.08(7)(a) and (b)

Revise to read -

(a) Prohibit *specific* activities on the property that may substantially interfere with a remedial action, operation and maintenance, long term monitoring, or other measures necessary to ensure the integrity of the remedial action.

(b) Prohibit *specific* activities that may result in human exposures above those specified for residential scenarios in Rule 391-3-19-.07(6) and (7) or for non-residential scenarios at Rule 391-3-19-.07(8) and (9), whichever scenario is applicable, and activities that would result in the release of a regulated substance which has been remedied in accordance with Rule 391-3-19-.07(10).

Rationale - A restrictive covenant shall be placed on a property instrument, but should address only those activities directly related to the site, not the property. Therefore, GIEC recommends language be incorporated to not overly-restrict a site or property that is unrelated to HSRA.

TABLE 1 COMPARISON OF SOIL NOTIFICATION CONCENTRATIONS TO TYPE I SOIL CRITERIA FOR SELECTED CONSTITUENTS PROPOSED CORRECTIVE ACTION RULES GEORGIA ENVIRONMENTAL PROTECTION DIVISION						
CHEMICAL (mg/kg)	NOTIFICATION CONCENTRATIONS (NC) (a)	CORRECTIVE ACTION TYPE I SOIL CRITERIA (CASC)				
		TYPE I-SOIL STANDARD (b)	GROUNDWATER CRITERIA (c) X 100	EQUATION 6 CONCENTRATION (d)	EQUATION 7 CONCENTRATION (e)	NC GREATER THAN LEAST CASC VALUE
METALS						
Arsenic	41	20	5.0 (e)	8.54 (e)	192.00 (e)	*
Beryllium	3	2	0.1 (e)	3.47 (e)	3,201.43 (e)	*
Cadmium	39	2	0.5 (e)	83,500.00 (e)	320.14 (e)	*
Chromium	1,200	100	10 (e)	12,500.00 (e)	3,201.43 (e)	*
Lead	300	75	1.5 (e)	ID	ID	*
Mercury	17	0.5	0.2 (e)	NA	192.00 (e)	*
Nickel	420	50	10 (e)	NA	12,814.29 (e)	*
VOLATILES						
Acetone	2.74	NA	400	NA	63,857.14	
Benzene	0.02	NA	0.5	8.78	1.59	
2-Butanone	0.79	NA	200	NA	6,042.86	
1,1-Dichloroethane	0.03	NA	400	NA	1,041.43	
1,1-Dichloroethylene	0.36	NA	0.7	2.14	5,742.86	
Methylene Chloride	0.08	NA	5.0	80.40	4,371.43	
Tetrachloroethylene	0.18	NA	0.5	73.30	6,385.71	
1,1,1-Trichloroethane	5.44	NA	20	NA	2,348.57	
1,1,2-Trichloroethane	0.5	NA	0.5	113.00	5,980.00	
Trichloroethene	0.13	NA	0.5	30.00	3,840.00	*
Vinyl Chloride	0.04	NA	0.2	0.000424	NA	*
Xylene	20	NA	1,000	NA	2,905.71	
SEMI-VOLATILES						
Bis(2-ethylhexyl)phthalate	50	NA	NL	1,070.00	12,814.29	*
Benzo(a)pyrene	1.64	NA	0.02	2.03	NA	*
Chrysene	5	NA	0.02	2,050.00	NA	*
Naphthalene	100	NA	2.0	NA	25,628.57	*
N-Nitrosodimethylamine	0.66	NA	0.00007	0.000451	NA	*
Pyrene	500	NA	100	NA	19,200.00	*
2,3,7,8-TCDD	8x10-5	NA	3x10-6	0.0000996	NA	*
PESTICIDES/PCBs						
Chlordane	9.2	NA	0.2	10.80	38.40	*
DDT	0.66	NA	0.01	39.90	747.00	*
Dieldrin	0.66	NA	0.002	0.762	32.01	*
Alpha-BHC	0.66	NA	0.0006	NA	192.00	*
PCB-1260	1.55	NA	0.05	ID	ID	*

NOTES: The least/applicable CASC is noted in bold, where applicable.

mg/kg - milligram per kilogram

NA - Not Applicable

NL - Not Listed

ID - Insufficient Data

SOURCE(S): (a) Rules of Georgia Department of Natural Resources, Chapter 391-3-19, Hazardous Site Response, Appendix III, Table 2
 (b) Rules of Georgia Department of Natural Resources, Chapter 391-3-19, Hazardous Site Response, Appendix III, Table 2
 (c) Rules of Georgia Department of Natural Resources, Chapter 391-3-19, Hazardous Site Response, Appendix III, Table 1
 (d) RAGS, Part B 391-3-19-07 (6)(c). . . Risk Assessment Guidance for Superfund: Volume 1 - Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals), * USEPA document EPA/540-R-92/003, December 1991
 (e) Numerical values were calculated for comparative purposes only.