GEC
Glynn Environmental Coalition

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September 1, 2015

Mr. Scott Martin, Remedial Project Manager
U.S EPA Region 4
Superfund Remedial Branch
61 Forsyth Street, SW
Atlanta, GA 30303-8960

Mr. Martin,

The purpose of this letter is to request information, and submit questions and comments to be included in the official record for the Propose Plan for the Terry Creek Dredge Spoil Areas Hercules Outfall Site, Outfall Ditch/Operable Unit One (1).

We trust the comments will help formulate a plan to develop a Proposed Plan that will obtain a timely cleanup and end the risk to human health and the ecosystem upon which the economic future of the Brunswick and Glynn County, Georgia, depend.

Sincerely,

Daniel Parshley, Project Manager

Enclosures

Terry Creek Dredge Spoils Areas Hercules Outfall Site - Comments on the Proposed Plan, Administrative Record, Remedial Investigation, and Feasibility Study

The Proposed Plan for the Terry Creek Dredge Spoils Areas Hercules Outfall Site attempts to answer the question, "What should be done about a ditch with 100 years of waste from a chemical plant?"

The Brunswick, Glynn County, Georgia community has patiently waited 15 years for the EPA to release the Proposed Plan for the Terry Creek Dredge Spoils Areas Hercules Outfall Site (Site). The results of this effort by the EPA is an apparent agreement between the EPA and Hercules Incorporated for a predetermined Remedial Action for the Outfall Ditch that solely benefits the company at the economic expense of the community and leaves potential health risks for generations to come.

The Administrative Record for the site has many comments from stakeholder agencies expressing concerns about the Proposed Plan, which are similar or the same as those expressed by the Glynn Environmental Coalition (GEC). Very basic and simple questions that need to be answered about every toxic waste site were apparently ignored in favor of rushing forward with a plan to remove a small part of the contaminated sediments and either rebuild or reroute the existing drainage ditch so the 100 years of wastes and poisons from the Hercules Plant can be left in place and covered.

Was the vertical extent of the contamination in the outfall ditch delineated?

How much separation is there between the bottom of contaminated sediments in the drainage ditch and the top of the contaminated groundwater underneath the Site?

Does the contaminated groundwater underneath the outfall ditch have the capability to re-mobilize the chemicals in the outfall ditch?

What is the EPA's reasoning for not analyzing for dioxin for the entire vertical depth of the contaminated sediments in the outfall ditch?

What is the horizontal extent of the contamination at the Site, including the areas proposed for re-routing the outfall ditch?

Why did the EPA choose to use an analytical method the EPA Office of Inspector General found inappropriate?

Why does the Propose Plan reference seafood sampling results that demonstrated the inability of the Toxaphene Task Force method (Method 1) to identify polychloro camphene?

Why does the EPA interject studies and reports from the now discredited Weinberg group and the discredited journal, *Regulatory Toxicology and Pharmacology*?

Why did the EPA add excavation of the sediments as a proposed remedial option (Alternative 2) after the analytical work was done for the Remedial Investigation?

Why did the EPA allow Hercules to sample for dioxin in a manner that would look at newly deposited sediments instead of the vertical extent of the historical contamination?

Why has the EPA interjected arguments developed by the Weinberg Group for the continued delay of the investigation and cleanup of the remaining operable units at the site, and was the toxaphene toxicological work undertaken by the Weinberg Group in 2006-7 ever competed? If not, why not?

The EPA July 30, 2015 presentation to the community, the Remedial Investigation, the Feasibility Study, the Administrative Record, and the Proposed Plan fail to present even the most basic information needed to evaluate a remedial plan for the Outfall Ditch. Considering this is the results of a 15 year effort, the level of incompetence in putting together and executing an even a minimally acceptable sampling and analysis plan is very troubling. A strong argument can be made for bringing in an outside firm like Black and Veatch to complete a competent investigation, produce an analysis of remedial options in a Feasibility Study, and design a protective Remedial Action Plan that does not leave potential risks to human health, the estuary, and the economy of the community going forward into the future for generations to come.

The July 30, 2015 EPA meeting revealed that the Proposed Plan was developed without consulting the community to ascertain what future land use would be likely in the area around the Hercules Outfall Ditch. Instead of speaking to the community, the EPA acted only in the interests of Hercules Incorporated by developing and presenting the least expensive and lease protective remedial options. Furthermore, the EPA was using misleading language in the Propose Plan such as “environmental controls” instead of institutional controls, which would economically restrain the future use of the area and result in adverse economic impacts to surrounding properties.

What is the EPA’s definition of “Environmental Controls?

The EPA Proposed Plan shows no sensitivity to the surrounding community which is primarily minority and low income. It is extremely doubtful a similar remedial plan would be proposed for the community blessed with greater economic resources. At no point in the July 30, 2015 EPA meeting was there any indication that the EPA had planned the proposed remedial action with input from other than Hercules and stakeholder agencies.

The EPA’s arrogance was further demonstrated by the meager 45 minutes allowed to the community and community leaders to voice their concerns about the Proposed Plan. The EPA and Hercules gets 15 years to produce the Propose Plan and the EPA is willing to give the community 45 minutes their time. Shameful, absolutely shameful. The combination of exclusion of the community from the decision-making process concerning the remedial options that would be compatible with future land use projections of the City of Brunswick and Glynn County has left no other option than to attempt to put all our concerns in writing in the very minimal time the EPA has allowed for public comment. The shameful conduct of the EPA reared its ugly head

again when they refused to provide the community with the modest time extension requested for the public comment period on the Proposed Plan.

With a 100-year-old wastewater ditch from a chemical plant sitting in the community, one would think the EPA's answer to what to do about it would be clean it up. To the contrary, the EPA plan advocates for leaving poison in our community, limiting the future use of the property, and leaving a significant risk in the community for generations to come. Further amplifying this risk is the proposed limit of 30 years of monitoring for the Site after the remedial action is completed.

Will the wastes the EPA proposes to leave in place continue to be toxic for more than 30 years?

The data presented in the Remedial Investigation indicates the vertical extent of contamination in the outfall ditch is not been delineated**. Can the EPA evaluate the number of years the wastes remaining in place will be toxic without knowing what chemicals are present and the vertical extent of contamination?**

The EPA appears to have a serious hang-up about gaining consensus on the toxicity of toxaphene in all the possible perpetuations and formulations theoretically possible as a pre-condition to taking any action at the Terry Creek Dredge Spoil Areas Hercules Outfall Site. EPA Region 4 has not shown the ability to describe or articulate clearly about the polychloro camphene pesticide manufactured at the Brunswick, Glynn County, Georgia Hercules plant site. With the help of the Weinberg Group and their associates, the EPA and Hercules appear to have concocted an obtuse argument for the sole purpose of delaying any meaningful cleanup of the Terry Creek Dredge Spoils Areas and in particular the Outfall Site. The EPA and Hercules appear to be rehashing all the doubt and confusion they have inserted into the Administrative Record for the Terry Creek Dredge Spoil Areas Hercules Outfall Site. A closer look at the Weinberg Group's involvement at the Terry Creek Site and the ramification of their action will be discussed in the Specific Comments Section. Since the Weinberg Group has been exposed by the Energy and Commerce Committee Congressional Inquiry, the tactics of this consultant and the relevance to the Terry Creek Site should be examined and addressed in the EPA Responsiveness Summary. Notable is the 3-4 year study of toxaphene toxicity by the Weinberg Group appears to have been abandoned around the time of the Energy and Commerce Committee Congressional Inquiry, but the Proposed Plan still references the need for this data as a pre-condition for continuing risk based remedial plans for the Site. The same scrutiny should be directed towards efforts to continue the Toxaphene Task Force Method (Method 1) 10 years after being found inappropriate by the EPA Office of Inspector General. Overall, the Proposed Plan appears to be based upon arguments by consultants and articles in a journal that have been repudiated by many agencies and a Congressional Committee. In a nutshell, the sleaze factor surrounding the Proposed Plan and the argument contained therein are overwhelming.

The question to be answered in the Proposed Plan is what to do with 100-year-old ditch that transferred waste from a chemical plant to our estuary. Like every other hundred-year-old chemical plant ditch, there will never be a consensus on the toxicity of all the poisons mixed up in the ditch over the past hundred years. The EPA has the audacity to represent that meaningful work will take place to resolve uncertainties concerning potential health impacts from the

different polychloro camphene chemicals found in Terry Creek and Dupree Creek. The reality of the situation is the EPA is not taking any current action to complete this work, which is a de facto admission by the EPA that they have no goodwill or intent of ever completing the toxicology and risk assessment work. The past 15 years of minimal action by the EPA to address risk from specific Parlars, and EPA Region 4's history of fighting against implementing the approved analytical method for polychloro camphene, underscores their recalcitrance in the matter of defining risk to humans and biota. In fact, when the most noteworthy omissions from the Administrative Record are any ecological or human health risk assessments to help drive remedial actions at the Terry Creek Dredge Spoil Areas Hercules Outfall Site, the competence of EPA Region 4 to developing a lucid Proposed Plan comes into question. Even if the EPA did complete analysis of the individual chemicals and risk to public health it would leave similar studies to be conducted on all the different trophic levels within the estuary. Common sense is no longer driving the cleanup of the Terry Creek Site and has been replaced by obtuse arguments. For example, at a minimum we would expect results from observed toxicity of the sediments in the Outfall Canal throughout the vertical extent of contaminated sediments. Simple and basic work is repeatedly ignored at the site. Just as the GEC has noticed the lack of basic and credible sampling and risk analysis, the Administrative Record is full of similar such concerns from the stakeholder agencies.

The Administrative Record contains documents referencing the agreement between the EPA and Hercules to circumvent the Superfund process and implement an Outfall Ditch remedy without identifying the vertical and horizontal extent of contamination, while limiting sampling to technical toxaphene as described by the Toxaphene Task Force (Method 1), the same discredited method by the EPA Office of Inspector General and many other agencies.

Do we need to know just how poisonous every chemical in the poisonous polychloro camphene chemical mixture is to develop a remedial plan? No, we don't and it is extremely likely the thousands upon thousands of potential chemical combinations theoretically possible from the manufacturer of polychloro camphene will ever be analyzed for their toxicity to humans and the remaining biosphere. The EPA's effort to identifying risk of the polychloro camphene to humans and other ecological receptors as a precondition for a remedial action or remedial response at the Terry Creek Site is preposterous and borderline ridiculous. Toxic sites nationwide contaminated with polychloro camphene have been remediated. The underlying problem appears to be all the arguments that been interjected by EPA Region 4, Hercules, and the discredited consulting firm, the Weinberg Group.

It is notable that neither the EPA nor Hercules bothered to complete the ecological risk assessment. The reason why is pretty obvious. It is general community knowledge that boats tied up near the Hercules plant outfall to kill everything growing on the bottom of the boat. Beyond a shadow of a doubt, the poison from the Hercules plant is an efficient killer in the marine environment. The polychloro camphene mixture was also widely used as a piscicide to kill fish in lakes Just another reason to stop this foolishness about trying to figure out what is or is not toxaphene and how poisonous is the poison and get on with removing 100 years of waste from the Hercules chemical plant wastewater ditch based upon competent delineation and characterization of the wastes, including the observed toxicity testing so noticeably missing from the Remedial Investigation and Feasibility Study.

The EPA needs to stop the hypnotic transfix on technical toxaphene, degraded toxaphene, whether toxaphene, and move on to removing the polychloro camphene manufacturing wastes that was released out of this outfall ditch, in addition to all the other chemicals deposited over the past hundred years the plant operated. It was pesticide manufacturing waste and all the other chemical discharged from the Hercules chemical plant over the past hundred years that need to be delineated both vertically and horizontally, characterized for treatment options, and a removal action plan implemented without further delay.

The Proposed Plan and What the EPA Proposes

There's really two issues being addressed in the Proposed Plan. The first is making a decision about where and how the new outfall ditch is constructed. This decision appears to be fairly straightforward. Alternative Five, the four boxes culverts, will reroute the existing outfall ditch allowing the old outfall ditch to be cleaned up. In addition, Alternative Five allows the greatest number of options for future use and development of the property, provided the poison is cleaned up. Without removal of the wastes accumulated over the past 100 years in the Outfall Ditch, the community will be left with economically harmful restrictions such as limited land use and the potential for wastes to be reintroduced should the Institutional Controls fail to limit development or be retained in the Community's Institutional Memory. For example, another site where Hercules is a party, the 4th Street Landfill, the restrictions on human access to the site was implemented as Institutional Controls and lasted around 6 weeks. The 4th Street Landfill was opened and utilized as parking for the football stadium. The history of Institutional Controls in Brunswick, Glynn County, Georgia, indicates a lack of adherence and being a bad fit for this community.

But, the EPA proposes leaving the poison in the old outfall ditch, and leaving the community with all the problems that it causes. According to the EPA, the Outfall Ditch Site will not be usable for residential development. The documents for the site also warned about future development and bringing the poison to the surface again. The only way this problem will be removed from the community is to remove the poison in the outfall ditch from our community. As previously stated, Institutional Controls have not been shown to be effective in protecting human health or restricting inappropriate uses of property in Brunswick, Glynn County, Georgia.

Notable are the "Institutional Controls" at the Terry Creek Site to educate the public about the risk of consuming seafood from the area or to make fishers aware about the seafood advisory are minimal or non-existent. The GEC does do outreach to the Terry Creek area with the seafood advisory developed in conjunction with the Glynn County Health Department, Georgia Department of Public Health, Coastal Resources Division and Environmental Protection Division of the Georgia Department of Natural Resources, and our partners at the University of Georgia Marine Extension and Sea Grant. With 126 locates where the GEC reaches out to fishermen and our limited budget to do so, our effort is at best described as a small piece of the resources needed for this problem.

Where can the EPA's plan be found for the "Institutional Controls" for fishermen and others potential impacted by the Terry Creek Site until such time as the remedial actions are implemented and seafood is no longer under a consumption advisory?

What is the budget designated by the EPA or Hercules for the "Institutional Controls" to address risk to those fishing and consuming seafood from the Terry and Dupree Creek Area?

What portion of the budget is directed to seafood consumption advisory signs in the Terry Creek, Dupree Creek, and Back River area?

What portion of the budget is focused for direct outreach and contact with habitual fishers from the Terry Creek Area?

Should a chemical plant clean up its waste outfall every hundred years? Is the EPA suggesting the answer to this question is no and just cover it up?

Yes, without doubt, a chemical plant should clean up its wastes and poison from their outfall ditch every hundred years. Any other option should not even be considered as part of any Remedial Investigation or Feasibility Study. The fact that the EPA is considering leaving 100 years of waste from a chemical plant in place and on top of the contaminated groundwater plume without knowing the vertical depth of contaminated sediments is beyond comprehension. The EPA's proposed plan leaves significant questions about the decision-making process at EPA Region 4 and their ability to plan and implement viable remedial actions.

The EPA's and Hercules continued use of the Toxaphene Task Force analytical method, also known as Method One, for the Remedial Investigation and Feasibility Study decision-making suggests an arrogance and insubordination to the findings of the EPA Office of Inspector General that determined an appropriate analytical method for polychloro camphene was needed to replace the Toxaphene Task Force method. Obviously, the inverse of the EPA Office of Inspector General's statement is the Toxaphene Task Force method is inappropriate.

Since the EPA documents contain statements like "what is toxaphene", I will start my specific comments with a detailed description of the polychloro camphene invention patented by Hercules Incorporated, which was manufactured at the Brunswick, Glynn County, Georgia, plant site, and the source of the wastewater discharged from the outfall ditch.

Specific Comments

Hercules Patent for Polychloro Camphene Insecticide – Description, Process, and Wastewater

Hercules patents the polychloro camphene invention on August 28, 1951, Patent Number 2,565,471. The invention was described as, "…an insecticidal composition and more particularly to an insecticidal composition containing a polychloro camphene as the toxic ingredient. "

Was the pesticide patented under Patent Number 2,565,471 by Hercules Incorporated manufactured at the Brunswick, Georgia, Hercules Plant?

Is the name of the pesticide in the Patent called polychloro camphene?

Was polychloro camphene pesticide manufactured in Brunswick, Glynn County, Georgia from 1948 until 1980?

Was the polychloro camphene produced at the Brunswick, Glynn County, Georgia Hercules Plant sold under many names and synonyms?

8001-35-2, Alltox, Geniphene, Phenacide, Toxadust,toxakil, Toxaphene, Chlorinated Camphene, Octachlorocamphene, Camphochlor, Agricide Maggot Killer, Alltex, Allotox, Crestoxo, Compound 3956, Estonox, Fasco-Terpene, Hercules 3956, M5055, Melipax, Motox, Penphene, Phenacide, Phenatox, Strobane-T, Toxadust, Toxakil, Vertac 90%, Toxon 63, Attac, Anatox, Royal Brand Bean Tox 82, Cotton Tox MP82, Security Tox-Sol-6, Security Tox-MP cotton spray, Security Motox 63 cotton spray, Agro-Chem Brand Torbidan 28, and Dr Roger's TOXENE, Camphechlor , Camphechlore , Camphene, chlorinated ,, Camphofene huileux , Chem-Phene , Chlorinated camphene (content of combined chlorine, 67-69%) , Chlorinated camphene, technical , Chlorinated camphenes , Chlorocamphene , Clor Chem T-590 , Compound 3956 , Coopertox , Cristoxo , Cristoxo 90 , ENT-9735 , Gy-Phene , Hercules toxaphene , Kamfochlor , M 5055 , Melipax , Motox , NCI-C00259 , Octachlorocamphene , Phenacide , Phenatox, Toxaphene (Technical chlorinated camphene (67-69% chlorine)) , TOXAPHENE (CA DPR Chem Code Text) , Toxaphene (Campechlor) , Toxaphene (Camphechlor) , Toxaphene (Polychlorinated camphenes)

The Polychloro camphene was reported to have been produced in many different formulations. Are the preceding names under which the Patent protected polychloro camphene pesticide was sold?

The specific toxic chemicals being patent protected by Hercules were described in Patent Number 2,565,471, as an insecticidal composition and more particularly to an insecticidal composition containing a polychloro camphene as the toxic ingredient.

.

> Now in accordance with this invention it has been found that insecticidal compositions containing as a toxic ingredient a polychloro camphene, having a chlorine content of from about **40% to about 75%**, possess an unusual degree of insecticidal activity.

> Because of the very high killing power of the polychloro camphenes, extremely dilute solutions of these toxicants are effective. (emphasis added)

Using the atomic weights of Carbon (12.01), Hydrogen (1.0), and Chlorine (35.4) the relative mass percent of each can be calculated from the description of chlorine content in the Hercules patent for polychloro camphene.

Number of Chlorine Moieties	Formula	Molecular Weight	Chlorine Molecular Weight	Percent Chlorine
1	C10 H15 Cl1	165.5	35.4	21.3%
2	C10 H14 Cl2	204.9	70.8	34.5%
3	C10 H13 Cl3	239.3	106.2	44.3%
4	C10 H12 Cl4	273.7	141.6	51.7%
5	C10 H11 Cl5	308.1	177.0	57.4%
6	C10 H10 Cl6	342.5	212.4	62.0%
7	C10 H9 Cl7	376.9	247.8	65.7%
8	C10 H8 Cl8	411.3	282.2	68.8%
9	C10 H7 Cl9	445.7	318.6	71.4%
10	C10 H8 Cl10	480.1	354.0	73.7%
11	C10 H9 Cl11	514.5	389.4	75.6%

The Hercules Patent, Number 2,565,471, describes any molecule of between 3 and 10 Chlorine moieties being the toxic ingredient of the invention.

Does the Hercules Patent, Number 2,565,471, describes any molecule of between 3 and 10 Chlorine moieties being the toxic ingredient of the invention?

Does the Hercules Patent, Number 2,565,471, very high killing power of the polychloro camphene, in extremely dilute solutions?

Does the Hercules Patent, Number 2,565,471, describe polychloro camphene as toxicants?

Does the Hercules Patent, Number 2,565,471, describe polychloro camphene as toxicants in the pesticide when chlorinated to between 3 and 10 chlorines per camphene?

Does the Hercules Patent, Number 2,565,471, specify any specific ratios of specific chemicals from the chlorination of camphene in the final product?

Does the Hercules Patent, Number 2,565,471, describe a chemical formula?

Can the Hercules Patent, Number 2,565,471, be describe more accurately as a recipe for the production of a polychlorinated camphene pesticide with a wide range of chemical components with 3 to 10 chlorine moieties?

Does the Hercules Patent, Number 2,565,471, describe a mixture of chemicals resulting in a chemically nonspecific product?

How many <u>individual chemicals</u> can be produced by the process described in the Hercules Patent, Number 2,565,471?

What is the number of <u>chemicals compositions</u> that can be obtained from the process described in the Hercules Patent, Number 2,565,471?

In accordance with the invention it was found that insecticidal compositions containing as a toxic ingredient a polychloro camphene, having a chlorine content of from about 40% to about 75% possess an unusual degree of insecticidal activity (pesticide). The killing power of the polychloro camphene in extremely dilute solutions of these toxicants and effectiveness was also noted.

Does the Hercules Patent, Number 2,565,471, claim killing power of polychloro camphene at extremely dilute solutions?

Does the EPA feel Hercules exaggerated the killing power of Hercules Patent, Number 2,565,471 with chlorine at 40 % to 75%?

The polychoro camphene invention was further described by the preferred total Chlorine percentages of the mixture of polychloro camphene.

> **Any polychloro camphene containing from about 40 to about 75%** of chlorine may be used as the toxic ingredient of the insecticide compositions of this invention. (emphasis added)
>
> And,
>
> The chlorinated camphene in accordance with this invention should contain an amount of chlorine of about 40% to about 75%, preferably from about 60% to about 72%.

Does the EPA agree Hercules Patent, Number 2,565,471, describes a pesticide manufacturing process to produce a pesticide formulation with a polychloro camphene between 40% and 75%?

In the process of reaching the goal an average of 60% to 72% chlorine attached to camphene, were polychloro camphene with more than 72% and less than 60% produced?

Does the goal of an average of 60% to 72% chlorine attached to camphene bracket polychloro camphene with between 6 and 9 chlorine per camphene?

Does the EPA have a sample of the pesticide produced each year at the Hercules plant?

How many samples does the EPA have of the pesticide produced at the Brunswick, Glynn County, Georgia, Hercules Plant, and what is the year of manufacture of each?

What was the variability between batches or production runs of the polychloro camphene pesticide at the Brunswick, Glynn County, Georgia, Hercules Plant?

Is the following definition of pesticide called toxaphene (the Patented Hercules pesticide called polychloro camphene) accurate?

> The bulk of the compounds (mostly chlorobornanes, chlorocamphenes, and other bicyclic chloroorganic compounds) found in Toxaphene have chemical formulas ranging from C10H11Cl**5** to C10H6Cl**12,** with a mean formula of C10H10Cl**8**.[3]The formula weights of these compounds range from 308 to 551 grams/mole; the theoretical mean formula has a value of 414 grams/mole.
> Source: http://www.worldofchemicals.com/chemicals/chemical-properties/toxaphene.html

Does the definition of "Toxaphene" include a range of polychloro camphene with 5 to 12 chlorines per camphene?

What does the word "mean" mean in the "Toxaphene" definition?

Does the word "mean" mean there are chemicals with less chlorine and more chlorine per camphene?

Does formula weight of these compounds ranging from 308 to 551 grams/mole describe polychloro camphene with 5 to 12 chlorines per camphene?

Does the described formula weight of these compounds ranging from 308 to 551 grams/mole describe polychloro camphene with 5 to 12 chlorines per camphene describe the definition of Toxaphene?

Does the definition or the Hercules Patent for polychloro camphene designate as specific chemical composition of the individual polychloro camphene chlorine weights in the pesticide?

Is "Technical Toxaphene" any formulation of polychloro camphene with a chlorine weight of around 40% to 75% chlorine per camphene, and preferably around 60% to 72% by weight of chlorine, and the toxic ingredients of the invention are polychloro camphene with 3 to 11 chlorines?

Polychloro Camphene Manufacturing and Wastewater Production

Patent Number 2,565,471. The invention was described as, "…an insecticidal composition and more particularly to an insecticidal composition containing a polychloro camphene as the toxic ingredient. "

The polychloro camphene manufacturing process and how the wastewater was produced are described in Patent Number 2,565,471 for the invention described as, "…an insecticidal composition and more particularly to an insecticidal composition containing a polychloro camphene as the toxic ingredient. " Two washings of the final product took place, with water washing being the final wash before drying the polychloro camphene. After camphene was chlorinated, the process moved on to distillation and washing.

> The carbon tetrachloride was removed from each of these samples by distillation under reduced pressure. An opaque, waxy solid remained in each case. This was dissolved in petroleum ether and the solution was washed with a sodium bicarbonate solution, **then with water** and finally was dried over sodium sulfate. (emphasis added)

From the washing process, the Hercules Plant effluent was produced and released from the Outfall into Terry and Dupree Creeks. Significant amounts of pesticide manufacturing wastes were deposited during the 38 years of pesticide manufacturing in Brunswick, Glynn County, Georgia.

Does the EPA agree the Brunswick, Glynn County, Georgia Hercules Plant released the wastewater from the manufacturing of polychloro camphene to the Outfall Ditch?

Has the EPA compared the wastewater with the polychloro camphene product to determine of the waste stream had the same chemical composition as the pesticide product?

How many samples does the EPA have of the pesticide manufacturing wastewater and the corresponding final polychloro camphene product?

From how many batches of production runs were the samples obtained?

During the 1948 to 1980 production run of polychloro camphene, how many years' worth of wastewater characterization does the EPA have for the Terry Creek Dredge Spoil Areas Hercules Outfall Site, and how often during the year was the data collected?

Does the EPA have the Hercules quality control data from the production of polychloro camphene?

Has the EPA asked for the Hercules quality control data from the production of polychloro camphene? If not, why not?

Would the Hercules quality control data from the production of polychloro camphene be helpful in understanding the composition of the pesticide manufacturing wastes discharged in to Terry and Dupree Creeks?

What is the variability in the chemical composition of the wastewater stream from the Hercules Plant from 1948 to 1980?

Does the goal of an average of 60% to 72% chlorine result in a production target of 6 to 9 chlorine per camphene specified in Hercules Patent, Number 2,565,471?

Do the polychloro camphene manufacturing wastes in Terry and Dupree Creeks predominantly contain the production target of 60% to 72% chlorine?

Will the EPA describe how the polychloro camphene manufacturing wastes entered the wastewater stream in future Terry Creek Dredge Spoil Areas Hercules Outfall Site documents?

Solubility of Polychloro Camphene in Wastewater

Do the different polychloro camphene chlorine weights result in different solubility for each in water?

If so, would the less chlorinated polychloro camphene (with less chlorine moieties) be more soluble in water? If not, why not?

Can these different polychloro camphene solubility's be used to predict the likely wastewater composition from the Hercules Plan during pesticide production?

Would information about the polychloro camphene manufacturing wastes provide information important in measuring any breakdown in the environment, and determining if the polychloro camphene at the Terry Creek Outfall site is consistent with what was discharged during pesticide production?

The EPA and Hercules have described the compositions of polychloro camphene as degraded or weathered but have never described the nature and composition of the wastewater stream from the Hercules Plant during manufacturing and final production. In addition, the rate of degradation cannot be determined without a clear description of the wastewater discharge at the time of release.

Did Reimold (1974) and Maruya (1999) essentially describe the same chemical composition of polychloro camphene in the sediments from Terry and Dupree Creeks?

If the observed chemical composition of polychloro camphene and Terry and Dupree Creek are remaining the same for an extended period of time, what evidence does the EPA have to support the formation of subcategories called degraded toxaphene and whether toxaphene?

What specific chemicals are present in EPA's definition of degraded toxaphene?

What is the metric being used by the EPA to quantify the rate of degradation in "degraded toxaphene"?

What are the differences in the chemical composition of degraded toxaphene and weathered toxaphene?

What are the differences in the chemical composition of degraded toxaphene and weathered toxaphene?

Are the terms degraded toxaphene and weathered toxaphene being used to describe the polychloro camphene chemicals that bioaccumulate? If so, what are the specific definitions of degraded toxaphene and weathered toxaphene bioaccumulation by species?

What specific chemicals are present in EPA's definition of weathered toxaphene?

What specific polychloro camphene must be present to meet the EPA's definition of weather toxaphene?

Is weather toxaphene the same as the polychloro camphene that bioaccumulate in biota? If so, what are the different polychloro camphene compositions of "weathered toxaphene" by species?

What is the metric being used by the EPA to quantify the rate of degradation (or "weathering") in "weathered toxaphene"?

Do all of the polychloro camphene chemicals being described in the sediments fall within the range of patent protected toxic ingredients of the patented Hercules invention for a polychloro camphene pesticide?

If not, what are the other chemicals present, and have they been identified and quantified?

EPA Terminology for Polychloro Camphene

The EPA has implemented a broad range of names and synonyms for the polychloro camphene patented and produced by Hercules. The most commonly used synonym is toxaphene but several more have been added over the years such as degraded toxaphene, weathered toxaphene, and technical toxaphene. Often these synonym terms are applied to polychloro camphene chemicals that are specifically (or selectively) bioaccumulated in one species or another. Often the discussion is incomplete and focuses only on fish and humans to the disregard of the remaining biosphere, including the well documented levels of polychloro camphene in the marsh cord grass, Spartina. In other instances the synonyms are applied to sediments and sludge's from polychloro camphene manufacturing with the assumption (conjecture) that the observed chemicals have somehow been altered in the environment without presenting any evidence to support the claim other than it is the author's best guess at explaining what is being observed. The more likely scenario is the observed chemical composition reflects the variability of batches

or production runs of polychloro camphene, which reinforces the argument for vertical delineation of the pesticide manufacturing wastes in the Outfall Ditch before covering. Actually, the vertical delineation of the outfall ditch might be the best opportunity to describe the breadth and scope of polychloro camphene manufactured at the Hercules plant, and characterize the waste for treatment or disposal characterization. What is important about the polychloro camphene synonyms is that they all are still describing the polychloro camphene pesticide patent protected by Hercules Incorporated.

Does the EPA agree that the synonyms toxaphene, degraded toxaphene, and weathered toxaphene all describe chemicals within the scope of the Hercules Patent for polychloro camphene pesticide? If not, what chemicals are being excluded? Have any of the chemicals being excluded been documented to NOT have been manufactured at the Hercules Plant?

If the EPA disagrees, what are the polychloro camphene chemicals in the Outfall Ditch that do not fall under the definition presented in the Hercules Patent and what percent of the total volume do they represent?

<u>Polychlorinated Camphene Analytical Standards</u>

Much has been written in the Hercules 009 Landfills Superfund Site documents and the Terry Creek Dredge Spoils Area Hercules Outfall Site documents concerning the variability among laboratory standards of polychloro camphene, which are commonly referred to as technical toxaphene. Literature concerning the manufacturing of polychloro camphene, the range of analytical standards for polychloro camphene, and the uncertainty associated with the chemical composition resulting from the polychloro camphene manufacturing process has been widely documented in peer-reviewed journals. In all cases and across all of the variability's observed in the various polychloro camphene standards the different chemical compositions were ALL technical toxaphene.

Does EPA agree that the broad range of specific chemical combinations found in the technical toxaphene analytical standards are a good indicator of the breath and scope of chemical combinations that can be reasonably expected from the manufacturing process used by Hercules to produce polychloro camphene?

Does the wide breadth and scope of technical toxaphene analytical standards contained the chemicals described in the Hercules patent for polychloro camphene?

Has the EPA looked at technical toxaphene standards to determine if a specific standard closely matches the polychloro camphene chemical combinations being observed at the Terry Creek Site?

Does the EPA have descriptions for the chemical composition and variability of polychloro camphene manufactured from 1948 to 1970?

<u>Analysis of Toxaphene Residues in Sediment and Fundulus from Terry/Dupree Creek 31 July 1998 (AR Reference - September 17, 1998 letter from L. Francendese, EPA Region 4)</u>

> Conclusions
> • Surface sediments and resident fish (Fundulus sp.) from the Terry/Dupree Creek tidal marsh system contain polychlorinated camphenes that are found in technical toxaphene.
> • Prominent PCCs include **hexa-, hepta-, octa-chlorinated congeners. In general, these congeners eluted in the early part of the chromatographic region where PCCs in unmodified technical toxaphene elute**
> • The most prominent PCC detected in the majority of samples was a compound, tentatively identified as 2-exo, 3-endo, 6-exo, 8,9, 10- hexachlorobornane ("Hx-Sed" or B6-923), thought to be a breakdown product of a previously characterized toxaphene component known as "toxicant B"
> • In general, the PCC profile in Fundulus resembled that of the corresponding sediment, indicating that sediment is a likely source of these PCCs. (emphasis added)

There has been a marked attempt by EPA Region 4 and Hercules to redefine what is "toxaphene", by asking the question, "What is toxaphene?', and otherwise obfuscate, confound, and cause doubt and confusion at every turn. Taken as a whole, the actions of EPA Region 4 and Hercules would be worthy of a second look by the EPA Office of Inspector General and the US Department of Justice. The above communication from Leo Francendese, EPA On-Scene Coordinator at the Terry Creek Site, shows how a clear situation and unambiguous problem has been confounded by EPA Region 4 and Hercules, mainly using the redefinition of polychloro camphene to the ambiguous terms of "weathered toxaphene" and "degraded toxaphene". Without doubt, the Terry Creek Site is contaminated by the pesticide product patented and manufactured by Hercules, and there is no ambiguity about what is in the outfall, marsh, or the seafood.

Do the surface sediments and resident fish (Fundulus sp.) from the Terry/Dupree Creek tidal marsh system contain polychlorinated camphene that are found in technical toxaphene?

Do the prominent polychloro camphene include hexa-, hepta-, octa-chlorinated congeners that, in general, eluted in the early part of the chromatographic region where PCCs in unmodified technical toxaphene elute?

<u>31 July 1997, K. Maruya to L Francendese - Aroclor 1268 and Toxaphene: Markers of Chemical Contamination in a SoutheasternU.S. Estuary, KEITH A. MARUYA* AND RICHARD F. LEE Skidaway Institute of Oceanography, 10 Ocean Science Circle, Savannah, Georgia 31411</u>

> Both PCBs and toxaphene were produced and used as technical mixtures; the chlorination of PCB formulations ranged from 20% to 68% *(14)* whereas technical toxaphene consists primarily of bornane and bornene structures with 6-10 Cl atoms resulting in a complex mixture that is —70% chlorine by weight *(15).* **Because manufacturing processes were for the most part nonspecific, these mixtures contained many different congeners,**

> **none of which accounts for more than 15% of the total by weight** *(16-18).* In the environment, the difficulty encountered in comparing residues to source material and/or pure, unmodified standards is exacerbated by **selective PCB/PCC transport,** transformation, uptake and accumulation processes *(19, 20). The* Thus, PCB/PCC profiles in contaminated aquatic biota are quite complex making it difficult to determine sources, fates, effects and the effectiveness of remediation strategies.
>
> We assessed concentrations and profiles in representatives of a simple estuarine food web to determine the pathway of contaminants into biota.
>
> In addition, there was a shift toward the earlier eluting peaks in these complex toxaphene-like signatures (Fig. 5).
>
> Earlier studies found enrichment of higher chlorinated (i.e. octa- and nona-) toxaphene components in fish muscle and fatty tissues *(30, 38).* However, the profile of toxaphene compounds in the present study reflected a pronounced shift toward earlier eluting PCCs (assumed to contain fewer chlorines) relative to our toxaphene standard. (emphasis added)

Was the problem encountered caused by use of an analytical toxaphene standard that did not match the specific chemical profile encountered at the Terry Creek Site?

Do other analytical toxaphene standards more closely match the chemical profile of polychloro camphene and polychloro camphene manufacturing wastes?

Were the manufacturing processes for the most part nonspecific, these mixtures contained many different congeners, none of which accounts for more than 15% of the total by weight, and these mixtures contained many different congeners?

What are the range of polychloro camphene produced from manufacturing processes that were for the most part nonspecific?

Are the earlier studies discussed above from the Terry Creek Site? If not, does it indicate a different congener profile was being encountered at the Terry Creek Site?

What are the ramifications to the Terry Creek Site from selective polychloro camphene transport, transformation, uptake and accumulation processes in seafood, benthic biota, and plants?

The study noted," However, the profile of toxaphene compounds in the present study reflected a pronounced shift toward earlier eluting PCCs (assumed to contain fewer chlorines) relative to our toxaphene standard." **Are there toxaphene standards that more closely match the congener profile at the Terry Creek Site? If so, why are they not used?**

Does the toxaphene standard used influence the quantification or identification of earlier eluding polychloro camphene?

What is the name of the company of companies providing the "technical toxaphene" analytical standard used at the Terry Creek Site?

What is the congener profile of the "Technical Toxaphene" analytical standard being used by the methods referenced in the Remedial Investigation and Feasibility Study, Method 1, Method 2, and Method 3? And,

Are all three methods using the same toxaphene analytical standard and who is the provider? What is the description of the toxaphene analytical standard?

Who makes the decision about which toxaphene analytical standard is used for the analysis by the three analytical methods described in the Remedial Investigation and Feasibility Study?

Keith A. Maruya, Tina L. Walters, Randall O. Manning, Residues of toxaphene in finfish and shellfish from Terry and Dupree Creeks, Georgia, U.S.A., Estuaries, August 2001, Volume 24, Issue 4, pp 585-596.

Abstract

To better characterize human health risks associated with potentially contaminated seafood, 56 composite samples of edible tissue of several finfish and shellfish species were analyzed for residues of toxaphene using gas chromatography with electron capture and negative ion mass spectrometric detection (GC-ECD and GC-ECNI-MS). Toxaphene in these samples, collected in 1997 near a former toxaphene plant in Brunswick, Georgia, were previously reported as non-detectable using non-selective techniques. Estimated total toxaphene concentrations (ΣTOX) ranged from less than 0.01 to 26 μg^{-1} on a wet tissue basis. Smaller, bottom dwelling finfish such as croaker, mullet, and spot exhibited the highest ΣTOX (0.76–26 $\mu g\ g^{-1}$), larger predatory fish including seatrout contained intermediate levels (0.08–4.4 $\mu g\ g^{-1}$), and shellfish (blue crab and shrimp) contained the lowest levels (<0.01 to 0.27 $\mu g\ g^{-1}$). For a given species, samples from the site furthest from the toxaphene plant had lower ΣTOX than samples from the other 3 sites. On a congener specific basis, levels ranged from <0.0025 to 3.5 $\mu g\ g^{-1}$. Congener distributions were, in general, dominated by 2-exo, 3-endo, 6-exo,8,9,10-hexachlorobornane (Hx-Sed) and 2-endo,3-exo,5-endo,6-exo,8,9,10-heptachlorobornane (Hp-Sed), breakdown products of Cl_8−Cl_{10} toxaphene homologs. Other prominent congeners confirmed by GC-ECNI-MS included Parlar numbers 26, 40/41, 42, 44, 50, 62, and 63, as well as several unidentified Cl_6−Cl_9 homologs. Minor differences in congener distribution among species and sampling locations suggested that exposure regimes and/or intrinsic biotransformation capabilities were not uniform. These results indicate that toxaphene residues were detectable in all species surveyed and at concentrations higher than estimated previously.

Were the same seafood samples tested by the Toxaphene Task Force Method (Method 1) where no toxaphene was reported as present re-tested by the Method 3, Negative Ion Mass Spectroscopy (NIMS) and toxaphene found in all samples?

Why is the EPA allowing an analytical method, Method 1, be used to guide the Remedial Investigation and the decision-making at the Terry Creek Site?

Is the reason Method 1 is being used at the Terry Creek Site because it has been demonstrated to NOT find the chemicals of concern?

Administrative Record

The Administrative Record (AR) contains communications, comments, and other documents concerning the Terry Creek Site and development of the Proposed Plan for the Outfall Ditch. In the absence of a Human Health Assessment, Ecological Risk Assessment, or data describing the vertical and horizontal extent of the contamination in the Outfall Ditch, the AR was reviewed to gain and greater understanding about how such a deficient Remedial Investigation and Feasibility Study were developed. Many of the comments from the stakeholder agencies reflect the same concerns expressed by our community, technical advisor Dr. Peter deFur, and others.

> **May 21, 2010, Jan Simmons GA-EPD to Scott Martin EPA**
>
> "While the concrete channel may provide a protective remedy, the contamination will remain, therefore, it would appear prudent from a long-term management standpoint to remove contaminated sediments to eliminate long term monitoring and maintenance." "Note that, to address long-term management, any remedy that does not address remediation to residential standards will need to include Institutional Controls (IC) to supplement the suggested remedial alterative for OUl."

We agree with the Jan Simmons at the Georgia Environmental Protection Division (GA-EPD) concerning removal of the contaminated sediments and eliminating long-term monitoring**. Does the EPA agree removal of the contaminated sediments will remove the need for long-term monitoring?**

What analysis did the EPA perform to quantify the economic impacts to the community (Glynn County and the City of Brunswick) from leaving the contaminated sediments in place?

What factors did the EPA consider as part of the economic analysis?

Where can the economic analysis of the impacts to the community from the Proposed Plan remedial options be found?

Were the benefits to the community and Hercules weighted, and if so, where can this analysis of economic benefits to both parties be found?

Did the EPA consider the economic ramifications of the proposed remedy on the community, or only Hercules/Ashland?

On what dates and locations did the economic analysis (concerning either or the City of Brunswick and Glynn County, and Hercules Incorporated/Ashland) take place and where can the results of these analysis be found?

What were the Environmental Justice considerations that went into the remedy selection process?

What are the names of the people and affiliations of those who evaluated the Environmental Justice considerations that went into the remedy selection process?

> **TO: Scott Martin, EPA RPM FROM: Tom Dillon, Ph.D. SUBJECT: NOAA Comments on Terry Creek OUl Focused RI/FS WP (7/2010) DATE: September 15, 2010**
>
> However, the WP lacks any rationale for why multiple methods are proposed. There may be sound, legitimate reasons for doing so; they just are not spelled out in the WP. §3.2.1.1 indicates Methods 1 and 2 will be used to analyze all sediment samples for toxaphene. An unspecified subset of sediment samples will be analyzed for toxaphene using the SW 846 Method 8276. The WP does not indicate why only a subset of samples is being relegated to a published EPA standard analytical method which the WP acknowledges as having "... better specificity and sensitivity when quantifying individual congeners ..." (§2.3).

Like Dr. Dillon from NOAA, we do not understand why the EPA implemented three different analytical methods for polychloro camphene at the Terry Creek Site. Utilizing three analytical methods obviously would cost more so it appears there was a compelling reason.

What are the rational for using multiple analytical methods for polychloro camphene?

Did the EPA require Hercules/Ashland to use multiple analytical methods for polychloro camphene?

Would the cost for using three different analytical methods been better utilized by fully determining the vertical and horizontal extent of contamination in the Outfall Ditch? If not, why not?

Did the EPA Office of Inspector General (EPA OIG) find Method 1 (the Toxaphene Task Force Method) inappropriate?

What was the decision-making process that led to using a method found to be inappropriate by the EPA OIG?

Are there email communications between the EPA and Georgia Environmental Protection Division discussing NOT testing (retesting) areas were the Toxaphene Task Force method was used previously?

Is the Terry Creek Site one of the sites where the Toxaphene Task Force analytical method was used in the past?

Is the use of the Toxaphene Task Force analytical method an extension of the agreement described in the June 29, 1993 letter from Marshall Steinberg, Vice-President, Hercules Health and Environment; to Harold Reheis, Director of the Georgia Environmental Protection Division, and Patrick Tobin, Action Director of EPA Region 4?

Did the June 29, 1993 letter from Marshal Steinberg describe an agreement between Hercules, the Georgia Environmental Protection Division, and EPA Region 4 to set criteria to limit the reporting of the quantity of polychloro camphene present?

Did the June 29, 1993 letter from Marshal Steinberg describe an agreement between Hercules, the Georgia Environmental Protection Division, and EPA Region 4 to use an analytical method that would not quantify or report chemicals that were present?

Did the EPA Office of Inspector General describe in great detail how chemicals were NOT being reported in his report Appropriate Testing and Timely Reporting Are Needed at the Hercules 009 Landfill Superfund Site, Brunswick, Georgia, Report 2005-P-00022 September 13, 2005?

Why does the EPA still insist on using an analytical method that has been repeatedly shown to under report, or report as not present, the amount of chemicals in samples?

Did the EPA Office of Inspector General found appropriate testing was needed in 2005?

Did the EPA Office of Inspector General explain in great detail how the Toxaphene Task Force method did not report polychloro camphene chemicals produced at the Hercules Plant?

Did the EPA Office of Inspector General explain in great detail how the Toxaphene Task Force method did not report the most prevalent polychloro camphene present in the Hercules 009 Landfill Superfund Site and Terry Creek Site, Hep-Sed and Hex-Sed?

Why does the EPA NOT want the quaintly of Hep-Sed and Hex-Sed reported in samples from the Terry Creek Site?

> **8 February 2012 - From Cristin Krachon Project Scientist to Scott Martin**
>
> The comment is for the TAUC quantitation technique used for Method 8081 be included in the SOP for Method 8276. However, TAUC quantitation will not be performed under Method 8276 and is therefore not included in the SOP. Per our telephone conversation on January 17, 2012, you indicated that this would be acceptable.

After finding comments about using three different analytical methods at the Terry Creek Outfall Site, it was very confusing to see communications about limiting the quantity and quality of

polychloro camphene data being produced under the EPA approved analytical method (Method 3). After the great effort and expense of analysis by three different methods, the rational for limiting the quality and quantity of data needs to be explained.

Does the acronym TAUC stand for Total Area Under the Curve?

Does TAUC report all the polychloro camphene present in the sample?

Does the TAUC Method report "Total Toxaphene" and Apparent Toxaphene" used by the Food and Drug Administration?

Does the U.S. Food and Drug Administration, in the "apparent toxaphene" method, instructs to include all peaks, and notes that relative heights and widths of matching peaks in the residue and reference standard will probably differ?

How does limiting the reporting of TAUC make the data more robust?

Was the reason for excluding TAUC by Method 8276 to avoid discovery of an under quantification of polychloro camphene by the Method 8081 TAUC?

Does the EPA have records of the decisions made via telephone in writing and incorporate them into the Administrative Record (AR)?

Where in the AR can the decision to excluded TAUC analysis by Method 8276 be located?

Did the 10 samples analyzed by EPA Method 8276 show an under quantification of polychloro camphene by the Toxaphene Task Force method?

> **Administrative Record document described as 15 July 2013 – Letter from Gregory Roush, Geosyntec; to Scott Martin, EPA RPM.**
>
> EPA General Comment No. 3 - With the exception of No Action, the remedial alternatives are primarily remedial technologies and process options that do not necessarily have to be used as standalone remedies. One or more of these technologies could be packaged into comprehensive remedial alternatives that achieve RAOs, satisfy ARARs, and satisfy the nine criteria of the National Contingency Plan (NCP) more effectively than each technology would alone. For example, sediment removal could be implemented in conjunction with Alternative 4A: Sheet Pile Channel.

We agree with the EPA concerning the combining of remedial alternatives to achieve RAOs, satisfy ARARs, and satisfy the nine criteria of the National Contingency Plan (NCP) more effectively than each technology would alone. Specifically, implementing Alternative 5, re-routing the outfall ditch through four box culverts followed by implementation of Alternative 2 appears to meet the criteria, provided the vertical and horizontal extent of contaminated sediments are determined and guides the removal action.

Why does the Proposed Plan not include the combination of alternatives packaged into a comprehensive remedial alternatives that achieve RAOs, satisfy ARARs, and satisfy the nine criteria of the National Contingency Plan (NCP)?

What was the decision-making process the EPA used to exclude implementation of Alternative 5 followed by Alternative 2 in the Proposed Plan?

Were the only remedies considered by the EPA those that leave contaminated sediments in place?

Did the EPA have an agreement with Hercules/Ashland to produce a Remedial Investigation and Feasibility Study that considered only remedies that left a significant amount of the sediments in place?

Was Alternative 2 added to the remedies to be included in the Proposed Plan late in the process?

On what date was Alternative 2, removal of the sediments, added to the Proposed Plan?

Is the data presented in the Remedial Investigation sufficient to implement Alternative 2?

> EPA General Comment No. 4 - Any remedial action that leaves contamination in place and does not allow for unlimited use/unlimited exposure (UUIUE) will result in the need for institutional controls.
> Response: Comment is acknowledged, and the need for institutional controls will be included in the evaluation of remedial alternatives presented/discussed in the Focused Rl/FS.

Even though the response to EPA General Comment No. 4 indicates institutional controls will be included in the evaluation of remedial alternatives in the Proposed Plan, the term "institutional controls" is not used other than in the definitions section. The Proposed Plan appears to skirt the institutional controls issue and the ramifications by using the term "environmental controls", which is not in the definitions section.

What was the EPA's rational for using the undefined term "environmental controls" instead of the defined term "institutional controls"?

Why did the EPA not define "environmental controls" in the Proposed Plan?

Did the obtuse nature of the EPA's use of "environmental controls" mask the actual meaning of the term, which appears to be "institutional controls"?

The response clearly states, "…need for institutional controls will be included in the evaluation of remedial alternatives presented/discussed in the Focused Rl/FS."

At the time the response was written, were there any proposed remedies that did not need institutional controls?

> **<u>Specific Comments - 15 July 2013 – Letter from Gregory Roush, Geosyntec; to Scott Martin, EPA RPM.</u>**
>
> EPA Specific Comment No. 1 - Section 2.1: The 7/23/10 response to comments stated that the deeper sediment cores would be collected to "evaluate sediment stability, vertical concentration profiles and the change in toxaphene concentrations over time; specifically in the last 10 years since the removal action was completed." **Based on the new bathymetric survey, very few of the deeper samples extended below sediment that has accumulated since the removal action, making comparison to previous data difficult. Also the deeper sampling did not fully define the vertical extent of contamination.** Additional sampling may be necessary to fully define the extent of contamination in OUl. (emphasis added)

We agree with the EPA concerning the need for a full delineation of the vertical extent of contamination in the Outfall Ditch, and strongly agree that vertical concentration profiles and the change in toxaphene concentrations over time need to be produced without further delay.

Please explain why the EPA has been unable to obtain sampling and analysis compliance from the Responsible Party?

What is the EPA decision-making process to resolve Responsible Party noncompliance, and at what point does the EPA have another party collect the data and bill the Responsible Party?

Does the EPA have the authority to contract for the remedial investigation and feasibility study and bill the recalcitrant Responsible Party?

Why has the EPA presented a Proposed Plan when the most basic information, which the EPA has already identified as being needed for a viable remedial investigation, has not been produced?

> EPA Specific Comment No. 4 - Section 2.1, footnote 1, states that a limited number of samples were analyzed for toxaphene congeners using Method 8276, and that the data are intended for informational purposes only and will not be utilized in the RI/FS process. The data will be provided in a separate document. These data should be included as part of the remedial investigation document.

What is the rational for sampling by the EPA approved method for polychloro camphene and then not utilizing the data?

For what informational purposes is the Method 8276 (Method 3) data intended?

What is the rational for excluding the Method 8276 data from the Remedial Investigation?

> EPA Specific Comment No. 8 - Section 4.4.3: It is difficult to agree with eliminating sediment removal based on implementation challenges when it has been implemented successfully at the site before. While it is agreed that removal alone will likely not achieve RAOs in the long term, it could be used in conjunction with other remedial technologies to develop remedial alternatives.

We agree with the EPA in that sediment removal has been implemented successfully and demonstrated to be effective at the Terry Creek Site. The possibility of not achieving RAO's should not deter efforts to reduce the risk to human health and the environment through a removal action.

Terry Creek Site and Dioxin and Furan

Is beyond comprehension that Hercules would make a statement about dioxin having never been detected in any of the solid waste management units (SWMU) covered by the facilities RCRA permit. Not only has dioxin been found in the SWMUs on the Hercules Plant Site, but as also been found at the Hercules 009 landfill Superfund Site and other places where toxaphene manufacturing sludge was disposed. The EPA should rebuke this less than truthful statement in the strongest terms. The EPA should also rebuke Hercules for including such a statement and demand that it never is included in another document for the Terry Creek Site. The inclusion of such a statement questions to credibility of all those associated with the Remedial Investigation and Feasibility Study. The EPA's propensity to look at the Terry Creek Site with blinders was evident at the July 30, 2015 meeting in Brunswick Georgia concerning the Proposed Plan. The community was concerned about the groundwater plume emanating from the plant site and underneath the Terry Creek Site and want to know what the implications were to the cleanup of the Site and if the groundwater contamination had the capability of mobilizing the contaminants. Obviously this is a great question to ask at this time considering the EPA is proposing to leave the contamination in place for the foreseeable future. Rather than address the community's concerns, the EPA had the audacity to say that groundwater contamination was a RCRA matter. If the EPA had looked at the source of Terry Creek contamination, which is the Hercules Plant Site; had the EPA taken the time to look at the analytical results for the sludge basins on the plant site, and the Hercules 009 Landfill Superfund site where toxaphene manufacturing sludge from the early 1970s till 1980 were disposed, it would've been clear from the data that dioxin is a well-documented contaminant in the pesticide manufacturing sludge and wastes.

Not only has dioxin been found associated with sediments and sludge, dioxin has been found in the groundwater associated with the former toxaphene impoundments at the Hercules plant site (RFI Table E-4-3). Similarly, dioxin was found in surface water at the Hercules 009 Landfill Superfund Site (Remedial Investigation Table 3-4). Dioxin was also found in the stream sediment adjoining the Hercules 009 Landfill Superfund Site (Remedial Investigation, Table 3-4). Dioxin was found in groundwater at the Hercules 009 Landfill Superfund site, also. And of course, dioxin was found in the toxaphene pesticide manufacturing waste sludge within the landfill. In every case where dioxin was sampled, dioxin was found associated with polychloro camphene manufacturing wastes.

What action will the EPA take to refute the continued assertion by Hercules Incorporated that dioxin was not produced with polychloro camphene pesticide?

Will the EPA incorporate dioxin and furan data from the sludge basins on the Hercules Plant site and the Hercules 009 Landfill Superfund Site into the body of knowledge for the Terry Creek site?

> **Administrative Record - RI/FS Work Plan April 2000**
>
> 8.2.3.1.2 Attributes Deserving Consideration in Future Risk Management Decisions - Similarly, dioxins may not be associated with the Hercules facility, and dioxins have never been detected in any of the SWMUs covered by the facility's RCRA permit. Further, dioxins appear to be widely distributed in Brunswick-area marshes, with higher concentrations found on the west side of the city than on the east side, where the Hercules discharge enters the marsh system [USEPA, 1999c]. Thus, any risk management of dioxins should consider alternatives beyond source control involving the Hercules facility. (Has dioxin been tested for in Hercules Plant SWMUs? What were the detection limits?)

Will the EPA include a statement in the description of the Terry Creek Site to include unequivocally that dioxin is associated with the Hercules facility and dioxins/furans have been detected in the solid waste management units on the plant site, and dioxin has been found in the sludge from the polychloro camphene manufacturing process at the Hercules 009 Landfill Superfund Site?

As noted by our technical advisor under the EPA Technical Assistance Grant program, Dr. Peter deFur with Environmental Stewardship Concepts, the RI/FS on page 38 indicates that dioxins were measured in two sediment samples, which is consistent with information that dioxin is a contaminant of toxaphene production. The next statement that the dioxin in sediment samples must be derived from other sources is not credible and needs to be removed.

Will the EPA order Hercules and Ashland to remove all statements from Terry Creek Site documents concerning dioxin and furan not been produced at the Hercules plant?

Administrative Record

> **RI/FS Work Plan April 2000**
>
> 6.2.2 ; RI Sampling - Creek sediment samples from areas expected to contain high concentrations of toxaphene (based on previous sampling results) will also be analyzed for dioxin at EPA's request. The number and location of these samples will be decided and included as part of Step 3 of the ecological risk assessment process.

Was step three of the ecological risk assessment process completed?

Was step three of the ecological risk assessment process avoided in order to avoid sampling for dioxin per the EPA's request?

As the dioxin sampling discussed in the remedial investigation and feasibility study work plan dated April 2000 been rescheduled?

Does the EPA agree the dioxin and furan sampling at the Terry Creek Site is deficient and significantly more data is needed before a Proposed Plan can be considered or implemented?

> 7.4.2 RI Sampling - Selected samples will also be analyzed for dioxin using Method 8081, the location and number of which will be determined during Step 4 of the Ecological Risk Assessment Process.

Was Step 4 of the ecological risk assessment process ever completed?

Is there an association between step four of the ecological risk assessment process not being completed and the failure test for dioxin?

Is Method 8081 the appropriate method for analysis of dioxin? If not, what is the appropriate method?

> 8.2.2.3.8 Overview of Screening Tables - Table 8-11 presents screening data for dioxins in sediment. In one background sample and one sample collected by USEPA [1997a], dioxin did not exceed the Region IV screening value. However, an additional sample collected in 1995 by the Brunswick Initiative does exceed the Region IV screening value. Only one sample was included from the Brunswick Initiative due to its proximity to the Hercules Facility. Tables 8-9, 8-12, 8-14, and 8-16 present comprehensive lists of all constituents analyzed for in surface water, sediment, subsurface soil, and surface soil, whether the constituent was detected or not.

The sampling for dioxin extending back to 1997 establish probable cause to believe dioxin and furans are associated with the manufacturing processes that took place over the past hundred years at the Hercules plant?

> 8.2.3.1.2 Attributes Deserving Consideration in Future Risk Management Decisions - Similarly, dioxins may not be associated with the Hercules facility, and dioxins have never been detected in any of the SWMUs covered by the facility's RCRA permit. Further, dioxins appear to be widely distributed in Brunswick-area marshes, with higher concentrations found on the west side of the city than on the east side, where the Hercules discharge enters the marsh system [USEPA, 1999c]. Thus, any risk management of dioxins should consider alternatives beyond source control involving the Hercules facility.

Will the EPA require all references to dioxin not being associated with the Hercules facility be removed from documents concerning the Terry Creek site?

ADMINISTRATIVE ORDER ON CONSENT FOR REMOVAL ACTION U.S. EPA Region 4 CERCLA Docket No. 98-04-C

The Administrative Order on Consent for the Terry Creek Site summarized how the area became contaminated and the investigations that led to the site being listed.

> **Ill FINDINGS OF FACT -** Hercules produced toxaphene, a chlorinated camphene pesticide, at its Brunswick facility from 1948 until it ceased its manufacture in December 1980.
>
> In 1994, tests of sediments taken by the U.S. National Oceanic and Atmospheric Administration from estuarine settings including the Terry Creek/Back River area indicated that sediments in Terry Creek **showed significant specific sediment toxicity not shown in other areas of the Brunswick/St. Simon's estuary**. (emphasis added) Subsequent analysis by EPA in 1997 revealed toxaphene in sediments in estimated concentrations of 1,300 ppm.

Has the EPA or any of the stakeholder agencies conducted additional specific sediment toxicity sampling in the vicinity of the Terry Creek Site since 1994? If not, why not?

Is the observed toxicity from the sediments important data to have in order to complete the ecological risk assessment?

Is observed toxicity data important to develop remedial action goals protective of human health and the environment?

> **Scott Martin/R4/USEPA/US 02/12/2008 01:51 PM To Lavon Revells/R4/USEPA/US@EPA, Shen-Yi Yang/DC/USEPA/US@EPA Subject Re: Question about the Total Area under the Curve**
>
> Lavon,
> As I understand it the TAUC method is used as sort of a "worst case scenario" method. I think it came about during work at Terry Creek in an attempt to further answers the "what is toxaphene" question. I think it is just being used within Region 4 right now.

Has EPA Region 4 considered reading the Hercules Patent for polychloro camphene so they can understand and answer the question, “What is Toxaphene”?

Is EPA Region 4 the only EPA Region that uses their version of total area under the curve (TAUC)?

Is EPA Region 4 the only EPA Region that uses the Toxaphene Task Force method, also known as Method One?

What is the analytical method used by other EPA Regions to delineate and plan cleanups of sites with polychloro camphene contamination?

Why is the EPA Region 4 trying to answer the question at Terry Creek, what is toxaphene?

Other than EPA Region 4, are there other EPA Regions trying to answer the question, what is toxaphene?

Have other EPA Regions produced final cleanup goals for Sites with Toxaphene? If so, what were the Action Levels for soil, sediment, and water?

Has EPA Region 4 gathered any data from the other EPA Regions that have produced successful Remedial Action plans for toxaphene contaminated sites? If so, which ones are being considered as guidance for the Terry Creek Site?

Does the Hercules patent for their polychloro camphene pesticide describe what toxaphene is? If not, what is the difference between the pesticide with polychloro camphene patented by Hercules and what EPA Region 4 refers to as toxaphene?

WORK PLAN FOR REMEDIAL INVESTIGATION/FEASIBILITY STUDY July 2001

Since the Proposed Plan for Operable Unit One is intertwined with the other operable units at the Terry Creek Site, Operable Unit Two and Operable Unit Three, and these documents have been included in the Administrative Record as part of the Proposed Plan for Operable Unit One, the following questions are submitted for an EPA response.

> Comment 2.- In addition, EPA has indicated that additional dioxin analyses are needed, but there is no indication of any dioxin analyses in Section 7.

Has dioxin analysis been added to section 7 of the remedial investigation and feasibility study work plan?

> Comment 57 - Table 7-1 - This table does not include all the samples and analyses to be conducted. In particular, background samples and dioxin analyses are missing.
> Response 57 - Table 7-1 will be modified to address previous omissions as well as additional sampling proposed in response to USEPA's comments contained herein.

Have the background samples and the dioxin analysis been added to table 7-1?

> 7.4.2 RI Sampling - In addition, five creek sediment samples from areas expected to contain high concentrations of toxaphene (based on previous sampling results) will also be analyzed for dioxin.

Have five Creek sediment samples been added for dioxin analysis in the remedial investigation?

> **FOCUSED REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN OPERABLE UNIT 1 (OU1) OUTFALL DITCH January 2012**
>
> **3.2.1.1 Site Characterization -** Dioxins, as requested will also be analyzed for in select samples.

Did the EPA specify the select sample locations for dioxin analysis? If not who selected the locations and the number of samples to be tested for dioxin?

> **4.2.1.1 Shallow Sediment -** Additionally, one composite sample from a post-weir and pre-weir transect will also be analyzed for dioxins. These data will be used to evaluate the presence of leachable compounds that may affect remedy design and selection, and to evaluate whether other COPCs may be present that may affect the remedial investigations at OU2 and OU3.

Why sample for dioxin only from 0 to .5 feet and .5 feet to 2 feet?

Are samples from 0 to .5 feet and from .5 feet to 2 feet located in sediments that of accumulated since the removal action in 1999 – 2000?

Was the EPA's rationale for not testing for dioxin throughout the vertical extent of polychloro camphene manufacturing wastes located in the Outfall Ditch?

Would dioxin data be helpful in determining the additive of toxic effects from polychloro camphene manufacturing wastes and other byproducts such as dioxin?

Have observed toxicity sampling been designated for the sediments in the Outfall Ditch? If not, why not?

Does the EPA agree it would be helpful to have observed toxicity data from the Outfall Ditch to quantify both human health risk and ecological risk from the undescribed chemical wastes the EPA proposes to leave in place?

Would observed toxicity data be helpful in developing Institutional Controls, if needed, for the final proposed remedy?

> **5.1.4 Summary of Other Compounds in Sediment**
>
> "Table 5-2 summarizes the detections for the additional compounds analyzed. Most other compounds detected in sediment were detected at estimated concentrations between the respective method detection limits (MDL) and the reporting limits (RL). These concentrations are not quantifiable but contain that a given compound is present. These low-level detections included metals, pesticides, polyaromatic hydrocarbons

(PAHs) and volatile organic compounds (VOCs). Dioxins were also measured and detected in two sediment samples. These compounds are addressed as part of the SLERA presented in Section 7 and .Appendix E. **Dioxins are not known to have been used or produced at the Plant. Since dioxins are ubiquitous in the environment, it is likely that the dioxins are present in the Outfall Ditch sediments due to other anthropogenic sources. (emphasis added)**

Will the EPA order Hercules to remove all statements arguing that dioxin was not produced at the plant during polychloro camphene manufacture from Terry Creek Site documents?

Why did the EPA not refute the statement, Dioxins are not known to have been used or produced at the Plant," back and 2000 when the Remedial Investigation Work Plan was being developed?

RI/FS, December 14, 2014

Table 1 - OUl Focused SLERA, Summary of Analytical Data Evaluated

(2) Deeper sediment samples were also analyzed for dioxins/furans. The results of this analysis are discussed in the SLERA uncertainty section.

What is the depth of "deeper sediment samples were also analyzed for dioxins/furans"?

Did the deeper sediment samples analyzed for dioxins/furans extend the entire vertical depth of contaminated sediments? If not, why not, and what was the decision making matrix used for to establish the sampling depths in the Outfall Ditch?

7.2.3.3 SLERA I uncertainty Assessment

The final component of Step 2 is to describe potential uncertainties associated with the SLERA. These uncertainties are included in Section 4.4 of the SLERA in .Appendix E.

'With regard to the specific remedy, risk-based numeric cleanup goals cannot be developed **because toxicity reference values for weathered toxaphene congeners have not been developed**. .As a result, defined goals for remedy success (i.e.. risk-based cleanup goals) cannot be developed and the volume of sediment to be removed under a dredging removal scenario cannot be quantified. **Therefore, a performance-based remedial goal that focuses on eliminating direct exposure to contaminates in the Outfall.** (emphasis added)

Ditch and eliminating the transport of contaminants to Dupree Creek and other downstream locations is recommended. This approach is consistent with the SEPA's Contaminated Sediment Remediation Guidance for Hazardous Waste Sites (USEPA. 2005) and the Principles for Managing Contaminated Sediment Risks at Hazardous

Waste Sites (USEPA. 2002), which collectively, highlight the consideration of separating the management of source areas with the most elevated concentrations of constituents from other, less concentrated areas. ‘

Was the Weinberg Group hired by Hercules around August 2007 to produce the toxicological work?

Was the August 23, 2008 email between David Clay, EPA Region 4; and Greg Luetscher, EPA Region 4, about the Weinberg Group and state that the work could take 2-4 years?

What was the final product produced by the Weinberg Group and when was it received by the EPA?

Why do the EPA and Hercules still contend this work must be completed before doing more work at the Terry Creek Site?

Does either Hercules or the EPA currently have toxicology work underway concerning polychloro camphene (also known as Toxaphene)?

If not, why is the toxicology work underway concerning polychlorinated camphene (also known as Toxaphene) not being done or being delayed?

Is delay of work at the Terry Creek the reason the toxicology work is not underway concerning polychlorinated camphene (also known as Toxaphene)? If this is not the reason, what is delaying the remedial activities at the Terry Creek Site?

8 FEASIBILITY STUDY

8.1 Purpose of the QUI Feasibility Study
The purpose of a feasibility study is to facilitate USEPA's selection of a Remedial Action Alternative for OU 1 at the Site. The National Contingency Plan (NCP) dictates that the selected alternative be protective of human health and the environment while complying with ARARs. The Focused FS for OIU provides an analysis of alternatives that are assembled based on the results of the Focused RI and the **SLERA presented within the previous section of this document**.

Table 7-3. Constituent Screening - Outfall Ditch Surficial Sediment
Terry Creek Superfund Site - Brunswick, Georgia
Footnote (9) Per the Work Plan, the **SLERA utilizes Method 1 toxaphene results**. The SLERA HQ is based on the EPA EcoTox SQB.

Table 7-5. SLERA Detected Constituent Screening - Outfall Ditch Pore Water
Terry Creek Superfund Site - Brunswick, Georgia
(10) Per the Work Plan, the **SLERA utilizes only toxaphene samples analyzed using Method 1.** Uncertainty associated with the results is discussed in the SLERA uncertainty section. (emphasis added)

Why is EPA Region 4 using Method 1, the Toxaphene Task Force method, when it has been demonstrated to NOT find toxaphene or polychloro camphene at 52 times the EPA DO NOT EAT level in biota?

Word escape me to explain how dumbfounded I am to see the EPA present a document with analysis by the Toxaphene Task Force method, an analytical method that has been discredited from within the EPA, other agencies, credible chemists, and from the environmental community as a whole. This is not a recent development and the analytical methods used by EPA Region 4 have been repudiated for over decade. The matter would not be so serious if there was not a large subsistence fisher population drawing their daily protein from these waters and taking the seafood home to those families. Shameful and despicable are far too tame of words for people who knowingly manipulate analytical data and sample analysis for no other reason than the financial wellbeing of the polluting company at the expense of those with minimal resources.

APPENDIX E - FOCUSED SCREENING LEVEL ECOLOGICAL RISK SSESSMENT TERRY CREEK OUl RI/FS

2.2.1 Site Operating History - Untreated wastewater from the production of toxaphene was discharged through the Outfall Ditch into Dupree Creek until 1972.

The Site Operating History state, "Untreated wastewater from the production of toxaphene was discharged through the Outfall Ditch into Dupree Creek until 1972," but the chemical composition and general characterization of this waste can't be found.

How was the waste stream formed?

Were there other manufacturing processes at the Hercules Plant from 1909 to 2015 that contributed to the waste stream?

What are the chemicals and wastes released in the wastewater over the 106 year history?

What documentation is being used to describe the waste stream and chemicals in the wastewater?

Has a comprehensive list of chemical, processes, and products produced at the Hercules plant been placed in the Terry Creek Site Administrative Record? If not, why not?

2.2.4 Fish Tissue Analysis

The release of toxaphene via the Outfall Ditch has resulted in detectable concentrations of toxaphene and chlorinated camphene (weathered toxaphene) in the tissues of aquatic organisms living in Terry and Dupree Creeks. A study from 1974 indicated that the body burden of fish species were in the part per million range (Reimhold and Dunint, 1974). Prior to the removal action the Georgia Department of Natural Resources (GDNR) conducted a study in 1997 which, at first, indicated that fish and shellfish did not contain

detectable concentrations of **technical toxaphene as quantified by the Task Force Method.** However, re-analysis of these samples using more sophisticated analytical methods (see Section 2.3) indicated that toxaphene residues were present at detectable concentrations in fish (Maruya. 2000). These detected concentrations caused GDNR to put specific fish consumption guidelines in place that recommended the limited consumption of certain fish species in the area (Maruya et al. 2001).

Historically. Analytical method SW-846 Method 8080 employing gas chromatography (GC) for separation and ECD (electron capture detector) for detection, was used for the analysis of TT. It became evident in the early 1990s that the interpretation of chromatograms was subjective and therefore, guidance for interpreting the toxaphene chromatograms was developed. The Toxaphene Task Force was convened by chemists from USEP.A. Georgia Environmental Protection Division (EPD) and Hercules, and chartered to develop what is now **known as the Task Force Method, or Method 1.**

For the OIH Focused RI ES. toxaphene samples were analyzed using Method I and Method 2. Since Method I is the most widely used method and is analogous to the SW 846 Method 808IB the data from this method are evaluated in the SLERA and will be used to inform remedial decisions OU1. Selection of this method is appropriate for OU1 because it is the only method for which there are screening criteria available for which to compare the results.

The Appendix E- Fish Tissue Analysis section discusses the use of the Task Force Method, or Method 1, analytical method, the failure to find the chemicals of concern in seafood. The section ends with a ridicules statement about being, "…the only method for which there are screening criteria available for which to compare the results." An analytical method that fails to find the chemical of concern does not produce any data which to compare results.

Does the EPA agree that an analytical method that does not find the chemicals of concern will not produce data which to compare results?

How much does Method 1 under quantify the amount of polychloro camphene, as described in the Hercules Patent?

<u>Administrative Record Doc # - 10784161 Doc Date 06/09/2015 Discussion of seafood sampling results</u>

Clearly, the entire Proposed Plan is built around a Work Plan designed to be misleading and produce deceptive data, which could lead to the false belief the Terry Creek Site is not dangerous. Both the Glynn Environmental Coalition and the EPA Office of Inspector General have described how the Toxaphene Task Force method, or Method 1, analytical method threatens the health and welfare of our community. The GEC submits the following comments and references concerning the Task Force Method, or Method 1, analytical method. As the title infers, there can be no other conclusion about the intent of those using Method 1, other than to hide the poison.

How to Hide the Poison
Under-Quantification of Polychlorinated Camphene (Toxaphene) in Brunswick, Glynn County, Georgia.
January 2001

Summary

The U.S. EPA, Georgia EPD, and Hercules Inc. met as the "Toxaphene Task Force" (TTF) and developed a method for identifying and quantifying the pesticide toxaphene in Brunswick, Georgia. The TTF method has threatened human health by failing to detect or significantly under quantifying toxaphene levels present in the environment. U. S. EPA and the Agency for Toxic Substance and Disease Registry toxicologist have documented why the TTF method fails to produce data that is useful in making their decisions and recommendations to protect human health. Analysis for toxaphene by gas chromatography with electron capture negative ionization mass spectrometric detection (GC-ECD and GC-ECNI-MS) has produced the data needed for toxicologist to make decisions protective of human health.

Background

The Glynn Environmental Coalition (GEC) is located in Brunswick, Glynn County, Georgia, where an insecticide mixture of polychlorinated camphene (PCC), commonly called toxaphene, was manufactured by Hercules Incorporated. Manufacturing of PCC took place at Hercules Incorporated, Brunswick, Georgia, from 1948 to 1980.[1] PCC is defined as camphene with 67% to 69% chlorine by weight, and is a complex mixture of over 670 separate chemicals.[2],[3],[4] During the period PCC was manufactured, PCC manufacturing wastes and PCC was discharged into the estuary by way of Dupree and Terry Creek at a rate of 250 to 300 pounds of PCC per day.[5] Fugitive emissions of PCC contaminated wind-blown dust, water runoff, and vehicle traffic distributed PCC throughout the neighborhoods around the Hercules Plant site.[6] In addition, significant amounts of PCC were deposited into at least four landfills and dumps in Glynn County.[7], [8]

In 1991, chemists from the EPA, EPD, and Hercules Inc., performed a limited study and developed a set of guiding principles for the determination of PCC in groundwater, soil, and manufacturing waste sludge samples from the Brunswick, Georgia, area.[9], [10] The results of

this limited study was the development of the "Toxaphene Task Force" (TTF) methodology for the identification and quantification of PCC. The TTF methodology was further modified in August 1997. [11] Even though the August 1997 modifications were proposed for only specified areas and only for soil and groundwater, the method has been used at Sites throughout Glynn County and has been used to determine PCC's in fish tissue for human health determinations.[12] The August 1997 method is also referred to as the "Hercules Protocol".[13]

The ability of the agreed upon TTF method to accurately identify and quantify PCC has been questioned by the Agency for Toxic Substance and Disease Registry (ATSDR) and the EPA.

Statement of the Problem

The method developed by the TTF for the identification and quantification of PCC in Brunswick, Georgia, seriously underestimates the true amount present, and excludes the PCC chemicals that health officials are most concerned about. Specifically, the TTF method fails to report the "total toxaphene" and "apparent toxaphene" that are the basis of recommendations by the EPA, Food and Drug Administration (FDA), and ATSDR toxicologist to protect human health and establish cleanup levels at PCC contaminated sites.

Local, State and Federal health officials rely upon the accuracy of data gathered on PCC levels to make recommendations to minimize or eliminate exposure of citizens through consumption of contaminated seafood, water, or contact with contaminated soil, sediments, and sludge. Based on PCC data collected, interim actions are recommended to protect the public in the form of seafood consumption advisories, and emergency removal actions, while long-term remedies are developed. High quality and accurate data is crucial in taking short-term actions and recommendations, and developing long term remedial plans.

Health officials from the EPA and ATSDR have identified the TTF method as seriously flawed in providing data meaningful to their deliberations on the potential health ramifications from the consumption of PCC contaminated seafood, and exposure to PCC contaminated air, soil, sludge, sediments, and water. The EPA and ATSDR are specific in the type and quality of data needed to make decisions protective of human health and the environment. Likewise, the

EPA and ATSDR have been specific in the ways the TTF method has threatened human health by failing to detect and understating actual PCC levels present. Most notable is that the TTF method excludes the fraction of the 670+ PCC chemicals that are of concern in making health based recommendations. Recent re-analysis of samples has shown that the TTF method failed to identify the presence of PCC in seafood at levels 52 times the EPA "do not eat" recommendation. The TTF method has failed to accurately identify PCC in many other samples, or to significantly understate actual levels of PCC present.

Discussion

Formation of the Toxaphene Task Force began at meeting on September 30, 1991, at the Georgia EPD. It was agreed that previously the regulatory agencies and Hercules had used a procedure that identified "apparent toxaphene" when analyzing environmental samples.[14] Analysis for "apparent toxaphene" is the criteria used by the U.S. Food and Drug Administration (FDA) to make health based recommendations for maximum levels of PCC in food.[15] It was agreed that if the U.S. EPA, Georgia EPD, and Hercules agreed upon the method and the findings of the task force, it would be used by the EPA for any work relating to the Superfund Site[16] or any RCRA matters pertaining to the Hercules facility involving toxaphene. It was proposed that those in attendance meet again to review the work of the task force and to discuss whether the samples do, in fact, reflect toxaphene or some other product. Clearly, a decision was made at the meeting to develop a PCC analytical method different from the health-based method currently in use.

The report of TTF, released June 4, 1993, was described as a very limited study of toxaphene analysis of real samples collected at the Hercules facility in Brunswick, Georgia.[17] The TTF method was designed to identify and quantify "technical toxaphene", instead of the "total toxaphene" or "apparent toxaphene" used by toxicologist in determining the potential risk to human health and the environment.

The TTF made specific changes in the identification and quantification of PCC that result in a significant reduction of "total toxaphene" and "apparent toxaphene". Quantification was limited to the 4-6 major peaks on the "back half" of the toxaphene chromatogram while many of

the prominent PCC's found in the "front half" are associated with unmodified technical toxaphene.[18],[19],[20],[21] The TTF further excluded PCC from the quantification process by eliminating any peak which is larger in proportion to the other component peaks in the sample than in the toxaphene standard.[22] The U.S. Food and Drug Administration, in the "apparent toxaphene" method, instructs to include all peaks, and notes that relative heights and widths of matching peaks in the residue and reference standard will probably differ. [23]

One chemist from the U.S. EPA noted that the "latter peaks" in samples were decreased and the "early peaks" were increased in environmental samples from Brunswick, and that the TTF method may seriously underestimate the true concentration of toxaphene.[24],[25] Because early and disproportionate peaks are eliminated from the quantification in the TTF method, it produces much lower PCC quantification results than those found using the U.S EPA approved Contract Laboratory Program (CLP) analytical method. The U.S. EPA Region 4 Environmental Services Division Laboratory analyzed split samples by the TTF method and a contracted laboratory by the U.S. EPA approved CLP method. Results showed that the TTF method either failed to detect PCC or only identified as little as 3.2% of the PCC present.[26]

Seafood samples collected in 1997 by the Georgia Department of Natural Resources, and analyzed by the Georgia Environmental Protection Division using the TTF method, were re-analyzed by the Skidaway Institute.[27] While PCC was not detected in any sample (n=56) using the TTF method, Skidaway detected PCC in every sample up to 26 parts per million (PPM). Even when the EPA "do not eat" levels of 0.5 PPM was exceeded by 52 times, PCC was reported as "not detectable" in fish by the TTF method.[28] The Food and Drug Administration (FDA) has a maximum allowable PCC level of 5 PPM in commercially caught seafood sold in the United States, until revoked in 1993.[29] In addition, in setting the FDA level, it makes the assumption that the seafood will be diluted in the Nation's food basket. The FDA also explicitly states that FDA maximum allowable levels are not to be applied to a seafood source consumed by the local population. The TTF method failed to find PCC at over five-times the FDA commercial level, yet commercial seafood harvest continues within the areas. Under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), food tolerance restrictions for toxaphene (PCC) range from 0.1 to 7 ppm. Therefore, the failure of the TTF method to detect toxaphene at

levels meaningful to the protection of human health and the environment presents local health threats and may have national significance.

ATSDR evaluated the data produced by the TTF method and found many concerns over it use.[30] The TTF method failed to accurately identify and quantify a known amount of the PCC in the calibration standard. They found that the composition of the weathered PCC in fish differs from that in the technical-grade PCC, and the PCC adsorbed on soil may have a different bioavailability than technical-grade PCC. In addition, the TTF method seems to eliminate the option to conduct a total area method that estimates the PCC concentration from all peaks in the chromatogram.[31] The ATSDR concluded that the use of the "back half" peak method (TTF method) is likely to result in significant underestimation of PCC concentration, and the estimated dose could be 10 times higher if historical data are taken into account for dose estimation.[32] ATSDR recommended that sensitive and specific methods, such as electron capture negative ion mass spectrometry (GC-ECNIMS) be used for the evaluation of toxaphene in fish and sediment.

Local, State, and Federal health officials depend on PCC data from the EPA, EPD, and Hercules Incorporated, in preparing remedial plans and making recommendations to potentially exposed citizens around contaminated areas. In addition, the Georgia EPD will NOT make a consumption recommendation without data.[33] An analytical method that fails to find the chemical of concern or that seriously understates the actual levels present fails to protect human health. Bad data leads to bad decisions and recommendations by local, State, and Federal officials that result in health threatening exposure of the citizenry. The integrity of the Nations food basket is compromised by flawed analysis that allows contaminated seafood to be harvested and sold.

Corrective action plans required by the EPA and EPD are promulgated on protection of human health and the environment. Remedial actions that are based upon faulty or inaccurate data will fail to fulfill the intent of the law, which is to protect human health. Any analytical method that fails to find the chemical(s) of concern (COC) at levels meaningful to the protection of public health is a threat to public health. When a method is represented to be accurate at levels meaningful to public health and fails to detect COC's, and the COC is reported as not

present, public health is jeopardized by the false belief that the seafood, soil, water, or sediments are safe to consume or be exposed.

Conclusions

The Glynn Environmental Coalition (GEC) believes that the U.S. EPA, Georgia EPD, and Hercules have entered into an agreement that failed to identify and under reported PCC levels present. This agreement has led to data that is a threat to human health and the environment because health agencies are making seafood consumption and soil, sediment, and sludge exposure recommendations based upon flawed data. In addition, remedial actions by the U.S. EPA and Georgia EPD will not be protective of human health and the environment because cleanup levels will not accurately reflect true levels of PCC present.

Recommendations

The GEC is seeking the following remedy for PCC sampling that has not produced data meaningful to the protection human health.

1.) Order that all future PCC analysis and quantification be done using Gas Chromatography with Electron Capture and Electron Capture Negative Ionization Mass Spectrometric Detection (GC-ECD and GC-ECNI-MS) for environmental samples such as fin- and shellfish or other biota, soil, sediment, sludge, and water.

2.) Order that all analysis and quantification report "total" PCC levels present.

3.) Order sampling, analysis, and quantification of PCC by GC-ECNI-MS in all areas and media previously analyzed and quantified by the TTF method in Brunswick, Glynn County, Georgia.

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Environmental Justice and Use of the Task Force Method, or Method 1, Analytical Method

The continued use of the Toxaphene Task Force Method, or Method 1, for more than a decade after being refuted by many agencies and organizations, the EPA Office of Inspector General, and the science community raises significant questions. As noted in the letter that follows:

> The stubborn insistence by Region 4 to continue to rely on a biased and unscientific method that has been rejected by the ATSDR and the OIG can cynically be viewed as a blind, ideological adherence to fiction in the face of facts. The result of these actions, whether ignorant or intentional, is a failure to provide the protection for human and environmental health that is promised in the mission[17] of the EPA.

The ramifications of EPA Region 4's insistence upon using the Toxaphene Task Force method, or Method 1, for an additional decade questions whether our community is receiving Environmental Justice from EPA Region 4. The appearance is EPA Region 4 is engaged in an active campaign to deny Environmental Justice to the City of Brunswick, and Glynn County.

Is the Toxaphene Task Force Method, or Method 1, use anywhere besides the Terry Creek Site?

The Glynn Environmental Coalition and organizations across the country looked at the "Toxaphene Task Force method, or Method 1" issue. The comments from Jennifer Sass, Ph.D., are just a relevant to the Terry Creek Site, which is referenced, and are as relevant today as when written and submitted to the EPA Office of Inspector General. Since the "Toxaphene Task Force method, or Method 1", is a key issue raised by the Glynn Environmental Coalition, and an issue that has been raised for well over 15 years, we request the comments By Dr. Sass and the references be put into the official comments on the Terry Creek Outfall Plan. Furthermore, the EPA should answer the question, **"How does continued use of the Toxaphene Task Force method, or Method 1, address Environmental Justice issues raises in the letter by Dr. Sass?**

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Public Interest Comments on the Office of Inspector General Reports:

Appropriate Testing and Timely Reporting are Needed at the Hercules 009 Landfill Superfund Site, Brunswick, Georgia[1]

Report 2005-P-00022; September 26, 2005
Report 2005-P-00022 (Addendum); September 13, 2005

and

More Information is Needed on Toxaphene Degradation Products[2]
Report No. 2006-P-00007, December 16, 2005

We, the supporters of this letter, advocate on behalf of our millions of members for regulations that provide protection to communities, workers, and wildlife. We do not have any financial interest in the subject of this letter.

Jennifer Sass, Ph.D., Natural Resources Defense Council (NRDC)[1]
Kathy Burns, Ph.D., ScienceCorps
Denny Larson, Director, Global Community Monitor
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Jeanne Rizzo, Breast Cancer Fund

Summary

The Office of the Inspector General, at the request the Glynn Environmental Coalition, has reviewed claims that a Glynn County, GA Superfund site contaminated with Toxaphene is receiving inadequate clean up. At the heart of the dispute is a testing method that fails to detect most of the toxic congeners and degradation products of toxaphene, thus underestimating the extent of contamination. Use of the biased testing method was approved by a closed partnership between EPA Region 4, the Georgia Environmental Protection Division (GaEPD) and Hercules, Inc. that failed to include community representatives. Both the OIG and a previous review by the Agency for Toxic Substances and Disease Registry(2002), have recommended that EPA should discard this flawed method in favor of established tests that identify toxaphene degradation products.

The Glynn County contaminated sites, predominately populated by low-income African-American families, provide EPA with an immediate opportunity to work with the community, apply appropriate scientific methods, and force the stringent clean up that was promised to the community over two decades ago when this site was listed as a National Priority Superfund site.

History of the site[3]**:** ***twenty years is too long***

Hercules Inc., a former pesticide plant, manufactured toxaphene as an insecticide at its plant in the city of Brunswick, Glynn County, Georgia, from 1948 to 1980. In these comments, we will use the term "polychlorinated camphene" (PCC) to describe toxaphene, a mixture of over 670 chemicals of concern, and its residues and conversion products.

The Hercules 009 Landfill Superfund Site in the city of Brunswick, in Glynn County, Georgia operated from 1975 until 1980, and was listed on the National Priorities List (NPL) in 1984, over 20 years ago[4]. The Brunswick area has a commercial fishing port and a thriving seafood industry, as well as recreational fishing and crabbing. [9]

The Hercules 009 Landfill is described as a 16.5 acre property that is bordered by Georgia State Highway 25 on the west; an automobile dealership on the north; a juvenile slash pine forest on the east; and several homes, a church, a school, and a strip shopping center to the south/southeast of the property.[5]

Until required by the Clean Water Act to treat waste water in 1972, Hercules reportedly released up to 200-300 pounds of PCC per day as waste water,[6] ranged from 2,332 parts per billion (ppb) in 1970 to 6.4 ppb in 1974.[7] PCC has been reported at levels exceeding 15,000 parts per million (ppm) at the Hercules 009 Landfill Site.[8] In 1976 PCC discharge was restricted to a daily maximum of 1 pound per day and a daily average of 0.5 pounds per day. Subsequent discharge was limited to 0.00081 ppm, though violations were recorded.[9]

In July 1988, Hercules and EPA entered into an Administrative Order on Consent for conducting a remedial investigation/feasibility study (RI/FS)[10] to assess the risk to human and environmental health and evaluate treatment approaches.[11]

In 2002, the Agency for Toxic Substances and Disease Registry (ATSDR), an agency of the U.S. Department of Health and Human Services, conducted a public health assessment of some of the Hercules waste areas in Brunswick.[12] In that report, ATSDR recommended limiting consumption of fish from the contaminated areas.

Both the ATSDR and the Office of the Inspector General (OIG) specifically identified the method advocated by EPA Region 4 and Hercules as insensitive, inadequate, and likely to significantly underestimate contamination levels, and instead recommended the use of pre-validated and scientifically accepted measurement methods. [13] [14]

Current clean up issues: ***intentionally insensitive methods fail to detect contamination***

The Hercules Landfill Superfund Site and five other sites contaminated by PCC in Glynn County, Georgia are slated for a sub-standard clean up that will leave at risk the community and the environment. This is being pushed through because of a closed partnership between EPA Region 4 and Hercules that excluded community participation. This pairing of between state regulators and the regulated industry was self-titled the Toxaphene Task Force. Among numerous biased and discredited pronouncements of this task force was use of a measurement method that failed to detect most of the over 600 congeners, residues, and degradation products of PCC contamination. The Region 4 assessment, relying on the flawed method, was strongly criticized by the ATSDR in a 2002 report as underestimating the exposure.[15] The OIG specifically noted that the methods used by Region 4 and Hercules are not designed to measure toxaphene degradation products, and instead recommended established testing methods that specifically test for toxaphene degradates.[16]

The stubborn insistence by Region 4 to continue to rely on a biased and unscientific method that has been rejected by the ATSDR and the OIG can cynically be viewed as a blind, ideological adherence to fiction in the face of facts. The result of these actions, whether ignorant or intentional, is a failure to provide the protection for human and environmental health that is promised in the mission[17] of the EPA.

Hazard information: ***Toxaphene is persistent, bioaccumulative, and banned***

Toxaphene is a toxic chlorinated-hydrocarbon persistent bioaccumulative banned pesticide. It is a mixture of over 670 chemicals of concern, and is approximately 40 to 75% chlorine by weight. In 1982 toxaphene was restricted in the US, and then fully banned in 1990. Although it has low solubility in water, it is readily adsorbed in soil and sediments, and bioconcentrates in aquatic organisms including fish. It is highly acutely toxic to fish, even at concentrations that are low parts per billion (ppb; one ppb is one part in 10^9, or roughly a drop in an Olympic-sized swimming pool) or high parts per trillion (ppt; one ppt is one part in 10^{12}, or roughly one second in 320 centuries).[18] [19] [20]

In its 2002 report of the Brunswick area, ATSDR described the relevant toxicity literature. Animal testing that pre-birth and post-natal exposure to toxaphene may interfere with normal development.[21] When pregnant rats were fed a diet contaminated with toxaphene, effects included poor righting ability and poor swimming ability, compared with healthy control animals.[22] The exposed rats eventually attained normal swimming ability. ATSDR also noted that, “when the rats took a maze test at the age of 70 days, those previously exposed to PCC components had difficulty remembering the path leading to the food”. ATSDR recommended that, “pregnant women and nursing mothers should avoid consuming large quantities of contaminated fish and, obviously, avoid ingesting contaminated soil” to protect the developing fetus and child. ATSDR warned that exposure to PCC through contaminated fish and surface soils, should also be minimized in infants and young children.[23] Air exposures should also be considered hazardous; PCC is up to 8% in soils at the Hercules Plant.

National interest: ***a bad job here may lead to failed clean-ups nationally***

NPL sites are the most serious sites across the country, slated for possible long-term cleanup by EPA's Superfund program. Altogether, there are 1,246 final sites across the country, of which 18 sites across 9 states include toxaphene as a contaminant.[24] Therefore, the level of clean up that EPA will require at this site is likely to impact requirements across the country.

The document record is clear that it is the intention of Hercules to submit its toxaphene review to the EPA database, the Integrated Risk Information System (IRIS), which contains EPA's scientific positions on potential human health effects from environmental contaminants. While not an enforceable regulatory standard *per se*, information on IRIS is considered by regulators at the state and federal level and others worldwide to set pollution cleanup standards and various exposure standards for air, water, and soil.

Hercules advocated a reduction in the cancer potency factor 10-fold on the IRIS database[25] from 1.1 mg/kg/day to 0.11 mg/kg/day, and stated that it has already gone so far as to submit its proposed factor to Office of Solid Waste and Emergency Response (USEPA/OSWER), based on "new information"[26] citing a 1998 report. This would likely severely impair clean-up action at contaminated sites all over the country.

In addition to weakening the cancer potency factor, Hercules also proposed to weaken the non-cancer "safe" level, known as a Reference Dose (RfD), posted on the IRIS database. In its comments to ATSDR, Hercules states that it has submitted an alternative RfD of 0.0007 mg/kg/day for the IRIS database.[27] This is approximately 3-fold more permissive than the old IRIS RfD of 0.00025 mg/kg/day (IRIS, 1993), which has now been removed from the IRIS database. Hercules specifically notes that use of its alternate RfD value would raise the screening level from 3 ppm to 7.5 ppm toxaphene in fish.[28]

It should be extremely concerning to taxpayers that a scientific article that proposes to disregard all but a handful of PCC congeners is co-authored by scientists from EPA Region 4 and the Georgia Environmental Protection Division (Simon and Manning, 2006). Though no source of funding is disclosed, it is published in a journal, *Regulatory Toxicology and Pharmacology*, well-known to be biased towards industry perspectives. In fact, in 2002 the journal was targeted in a letter by over forty scientists, including noted international experts and journal editors, citing concerns about, "apparent conflicts of interest, lack of transparency, and the absence of editorial independence".[29] Specifically, their letter cites, "the journal's apparent bias in favor of industries that are subject to governmental health and environmental regulations". The letter goes on to identify financial supporters of the journal sponsor, including, the American Chemistry Council, Dow AgroSciences, R.J. Reynolds Tobacco Co., and others. Moreover, the letter identified a "significant percentage" of the editorial board with financial ties to companies whose products are the subjects of studies published in the journal. Is it any wonder, then, that this article advocating a weakening of cancer potency of toxaphene found its way to this journal? But, the fact that the authors are public employees suggests a disconcerting level of partnership between Hercules and the regulatory agencies.

Environmental Justice: ***EPA fails to act on Executive Order 12898***

The State and Federal agencies charged with the protection of human and environmental health are faced with a moral test of deciding whether to unfairly burden Glynn County families with health risks that they are not likely to bear themselves, and that are not shared equally across the nation.

Glynn County is comprised of 72% white population and 26.5% black population, more diverse than the National average of 80% white and 13% black (2004 Census data).[30] However, the Brunswick city has a total population of approximately 15,600 people, of which 36% are white and 60% are black (2000 Census data as reported by ATSDR).[31]

(data are rounded off)	Brunswick city (2000 data) [32]	Glynn County (2003/4 data)[33]	US (2003/4 data)[34]
White persons	36%	72%	80%
Black persons	60%	27%	13%
Median household income	$22,000 ($18,400 for black; $27,900 for white[35])	$38,000	$43,000
Persons living in poverty	30%	15%	12.5%

The county has approximately 27,000 households (2000 data), with The county The county has approximately 27,000 households (2000 data), with a median household income of $38,600, less than the National median of $43,300 (2003 data). However, Brunswick City has a median household income of only $22,200 (2000 data), much lower than the county and national. This leaves 15% of Glynn County residents living below poverty (2003 data), more than the National average of 12.5%. However, 30% of Brunswick City residents live below poverty (2000 census data). In summary, Glynn County residents are more likely to be black and/or to be poor than the average American.

In addition to the Hercules 009 Superfund site, the Brunswick area is the site of two additional industrial facilities that have been classified as Superfund sites, and 17 other potentially hazardous waste sites.[36] Maybe the unfair distribution of toxic dump sites and other industrial facilities is a significant factor in the higher rate of cancer and other diseases among black residents compared with white residents of Glynn County. In the health service area that extends from Duval County (Jacksonville) FL to Glynn County GA, EPA reports that the overall cancer rate per 100,000 population is 177 for white males compared with 257.7 for black males.[37] The cancer rate for white females is 118.4, compared with 135.1 for black females. Childhood leukemia rates are almost 2-fold higher for black males (14.1 per 100,000), compared with white

males (8.9 per 100,000);[38] data for females is similar for white (6.1) and black (4.9) populations.

The EPA provides a description of environmental justice on its website:

> Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. EPA has this goal for all communities and persons across this Nation. It will be achieved when everyone enjoys the same degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn, and work.[39]

Despite this laudable and critical recognition of the unfair distribution of risk and disease across this country, a study just released in September 2006 by the Office of the Inspector General is highly critical of EPA's failed record on taking action to correct these injustices.[40] The IG recommended that EPA review its programs appropriately and take action consistent with Executive Order 12898 to address the unfair impact of industrial waste on communities.[41]

Take action now to protect human health

We generally support the OIG reports, and encourage the OIG to issue a strong response to EPA to work with the community, apply appropriate scientific methods, and force the stringent clean up that was promised to the community over two decades ago when this site, predominately populated by low-income African-American families, was listed as a National Priority Superfund site.

Thank you for your consideration of these comments.

Respectfully,

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[1] To whom correspondence should be sent. Full contact information at end of these comments.

[1] summary at http://www.epa.gov/oig/reports/2005/20050926-2005-P-00022-Gcopy.pdf
full report at http://www.epa.gov/oig/reports/2005/20050926-2005-P-00022.pdf
addendum at http://www.epa.gov/oig/reports/2005/20050926-2005-P-00022A.pdf

[2] summary at http://www.epa.gov/oig/reports/2006/20051216-2006-P-00007-Gcopy.pdf
full report at http://www.epa.gov/oig/reports/2006/20051216-2006-P-00007.pdf

[3] EPA. Georgia NPL/NPL Caliber Cleanup Site Summaries. http://www.epa.gov/region4/waste/npl/nplga/herculga.htm

[4] CERCLIS ID GAD980556906

[5] EPA. Georgia NPL/NPL Caliber Cleanup Site Summaries. http://www.epa.gov/region4/waste/npl/nplga/herculga.htm

[6] ATSDR. Public health assessment: Terry Creek dredge spoil areas/ Hercules outfall site, Brunswick, Glynn County,
Georgia. 2002. http://www.atsdr.cdc.gov/hac/PHA/terrycreek/tcd_toc.html

[7] http://www.atsdr.cdc.gov/hac/PHA/terrycreek/tcd_p1.html#backa

[8] EPA. Georgia NPL/NPL Caliber Cleanup Site Summaries. http://www.epa.gov/region4/waste/npl/nplga/herculga.htm

[9] http://www.atsdr.cdc.gov/hac/PHA/terrycreek/tcd_p1.html#backa

[10] Definition of RI/FS http://www.epa.gov/superfund/whatissf/sfproces/rifs.htm

[11] EPA. Georgia NPL/NPL Caliber Cleanup Site Summaries. http://www.epa.gov/region4/waste/npl/nplga/herculga.htm

[12] http://www.atsdr.cdc.gov/hac/PHA/terrycreek/tcd_p1.html#backa

[13] summary at http://www.epa.gov/oig/reports/2006/20051216-2006-P-00007-Gcopy.pdf
full report at http://www.epa.gov/oig/reports/2006/20051216-2006-P-00007.pdf

[14] ATSDR report (2002) Appendix F: Response to comments. ATSDR states, “On April 14, 2000, ATSDR formally received an analytical protocol from USEPA, Region IV describing the "Procedures for the Determination of Toxaphene," a three-page protocol dated August 14, 1997. This protocol, which was intended to be used by USEPA-Region IV and Hercules, employed "the last four to seven peaks in the 'back half' of the toxaphene chromatogram for calibration and quantification of toxaphene."

The "four peak in the back half" methods dates to the packed column days, when there were only several usable peaks shown on the back half of toxaphene chromatogram (USEPA 1986 Method 8080). This "four-peaks-in-back- half" method was precise at that time... This method, however, has lost its precision now because the powerful capillary column in modern gas chromatography instruments generates dozens of peaks in the back half of the chromatogram of

toxaphene standard... Although the Method 8081A of January 1995 kept this "four-peaks-in-back- half" method, the method was purged from the official December 1996 version of Method 8081 A, as well as the new Method 8081 B of January 1998. Recently, GA EPD repeated the analysis of 56 samples from the old April 1997 samples with the specific methodology of both GC-ECD and GC-MS at Skidaway Institute of Oceanography.

On June 19, 2000, quantitative data for the 56 samples became available and the PCC concentrations up to 26 ppm was found in fin fish. This work was published in peer reviewed, open literature in September 2001."

http://www.atsdr.cdc.gov/hac/PHA/terrycreek/tcd_p3.html#appf

[15] http://www.atsdr.cdc.gov/hac/PHA/terrycreek/tcd_toc.html

[16] summary at http://www.epa.gov/oig/reports/2006/20051216-2006-P-00007-Gcopy.pdf

full report at http://www.epa.gov/oig/reports/2006/20051216-2006-P-00007.pdf

[17] "The mission of the Environmental Protection Agency is to protect human health and the environment."

http://www.epa.gov/epahome/aboutepa.htm#mission

[18] Maruya KA and Lee RF. Arochlor 1268 and toxaphene in fish from a southern U.S. estuary. Environ Sci Technol 1998;32:1069-75.

[19] ATSDR report. 2002. http://www.atsdr.cdc.gov/hac/PHA/terrycreek/tcd_p1.html#sum

[20] The ATSDR report Appendix F reported that, "The acute LC50 values for other kinds of fish ranged from 2 ppb for basses to 18 ppb for bluegills. PCC in chronic exposure systems were one to three orders of magnitude more toxic to fish than were acute exposure systems. The chronically toxic effects of PCC were observed at 39 ppt in brook trout, and at 36.7 ppt in fathead minnow." http://www.atsdr.cdc.gov/hac/PHA/terrycreek/tcd_p3.html#appf

[21] Agency for Toxic Substances and Disease Registry. Toxicological profile for toxaphene. Atlanta: US Department of Health and Human Services; August 1996.

[22] Olson KL, Matsumura F and Boush GM. Behavioral effects on juvenile rats from perinatal exposure to low levels of toxaphene, and its toxic components, toxicant A, and toxicant B. Arch Environ Contam Toxicol 1980; 9:247-57.

[23] http://www.atsdr.cdc.gov/hac/PHA/terrycreek/tcd_p1.html#backa

[24] Query for toxaphene, September 26, 2006. http://oaspub.epa.gov/oerrpage/basicqry

[25] IRIS database. Toxaphene. http://cfpub.epa.gov/iris/quickview.cfm?substance_nmbr=0346

[26] ATSDR report, 2002. Appendix G. p. 113
http://www.atsdr.cdc.gov/hac/PHA/terrycreek/tcd_p4.html#appg

[27] ATSDR report, 2002. Appendix G. p. 111
http://www.atsdr.cdc.gov/hac/PHA/terrycreek/tcd_p4.html#appg

[28] ATSDR report, 2002. Appendix G. p. 111
http://www.atsdr.cdc.gov/hac/PHA/terrycreek/tcd_p4.html#appg

[29] Axelson O, Balbus JM, Castleman B, Cohen G, Davis D, Donnay A, Doolittle R, Duran BM, Egilman D, Epstein SS, Goldman L, Grandjean P, Hansen ES, Heltne P, Huff J, Infante P,

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[30] http://quickfacts.census.gov/qfd/states/13/13127.html

[31] Census data. Profile of General Demographic Characteristics: 2000. Geographic area: Brunswick city, Georgia.
http://censtats.census.gov/data/GA/1601311560.pdf

[32] Census data. Profile of General Demographic Characteristics: 2000. Geographic area: Brunswick city, Georgia.
http://censtats.census.gov/data/GA/1601311560.pdf

[33] http://quickfacts.census.gov/qfd/states/13/13127.html

[34] http://quickfacts.census.gov/qfd/states/13/13127.html

[35] US Census Bureau. Fact Sheet. Brunswick city, Georgia.
[36] See ATSDR report and Fig 1 map at
http://www.atsdr.cdc.gov/hac/PHA/terrycreek/tcd_f1.gif

[37] Data from the US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics, Atlas of United States Mortality (1997). Visualized using EPA enviro-mapper.

[38] National Cancer Institute Cancer Mortality Maps & Graphs. Numbers are per 100,000 population, from 1970-1994.
[39] http://www.epa.gov/compliance/environmentaljustice/

[40] Office of the Inspector General. EPA needs to conduct environmental justice reviews of its programs, policies, and activities.
Report No. 2006-P-00034. September 18, 2006.
http://www.house.gov/apps/list/speech/ca32_solis/ej-epa_report.pdf

[41] Office of the Inspector General. EPA needs to conduct environmental justice reviews of its programs, policies, and activities.
Report No. 2006-P-00034. September 18, 2006.
http://www.house.gov/apps/list/speech/ca32_solis/ej-epa_report.pdf

EPA and Environmental Justice in Brunswick, Georgia

> "Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. EPA has this goal for all communities and persons across this Nation. It will be achieved when everyone enjoys the same degree of protection from environmental and health hazards and **equal access to the decision-making process** to have a healthy environment in which to live, learn, and work." http://www.epa.gov/environmentaljustice/

Since 2000, how many meeting did the EPA have with local officials and citizens in Brunswick, Glynn County, Georgia, during the development of the Proposed Plan for the Outfall Ditch? And,

On what dates and locations did the meetings to provide equal access to the decision-making process take place?

Who did the EPA invite to attend the meetings and was there public notice to involve the community in the Terry Creek Site decision-making process?

Since 2000, how many meetings did the EPA have with Hercules, their contractors, or consultants representing the Responsible Parties? And,

On what dates and locations did the EPA have meetings with Hercules, their contractors, or consultants representing the Responsible Parties?

Administrative Record

Letter from Tim Hasset, Hercules, to Scott Martin, EPA. December 15, 2014

The enclosed document includes that evaluation, and Hercules reiterates its belief that Alternative 4 (Concrete-Lined Channel Rerouted with Limited Sediment Removal formerly Alternative 3) is the best remedy for OU 1.

When did Alternative 3 become Alternative 4?

Did Alternative 3 become Alternative 4 late in the process due to the addition of a sediment removal option, Alternative 2?

Was the Outfall Remedial Investigation Work Plan sampling and analysis plan designed to support a sediment removal option? If not, why not?

If the Outfall Ditch Remedial Investigation Work Plan sampling and analysis plan was designed to support a sediment removal option, why is the vertical extent of contamination not defined in the Outfall channel?

Letter from Tim Hasset, Hercules, to Scott Martin, EPA. December 15, 2014 RESPONSE TO COMMENTS: TERRY CREEK SITE - DRAFT FOCUSED REMEDIAL INVESTIGATION/FEASIBILITY STUDY, OPERABLE UNIT 1 (OU1): OUTFALL DITCH COMMENTS FROM EPA RECEIVED JULY 2, 2014

General Comment No. 1: Hercules Response - There are numerous issues associated with including a removal/dredging alternative for OU1 in the Focused RI/FS Report. First, dredging operations are typically performed to remove sediment containing

> chemicals of concern above calculated risk-based concentrations. A new analytical method has been developed to analyze weathered toxaphene congeners in abiotic media (sediment) and, **toxicity reference values for these weathered toxaphene congeners to environmental receptors have not been developed**. Therefore, numerical risk-based cleanup goals cannot be developed and the volume of sediment to be removed under a dredging/removal scenario cannot be reliably quantified. Therefore, developing a remedy alternative without clearly defined goals for success (i.e. risk-based cleanup goals) will result in an ambiguous technical approach and huge uncertainties in the associated implementation costs. Additionally, removing sediments to background (non-detect) concentrations is neither practical nor required under the NCP. (emphasis added)

Did Hercules hire the Weinberg Group in 2007 to conduct a toxicological study? (Source: EPA Briefing Summary, August 20, 2007)

Was the toxicological study by the Weinberg Group expected to be complete in 3-4 years?

Was the study completed, and if not, why not?

Are there any ongoing "Weathered Toxaphene" toxicological studies by the EPA or Hercules, and if not, why not?

If there are no other toxicological studies planned or in progress, is " ….toxicity reference values for these weathered toxaphene congeners to environmental receptors have not been developed," an excuse to hold up remedial activities?

What is the definition of "Weathered Toxaphene" by total chlorine weight, number of chlorine per camphene, and the specific chemical composition?

Have other cleanups of toxaphene or polychloro camphene sites been completed by the EPA in the United States, and if so, where are they located and how did they "define goals for success"?

What technologies have been used to cleanup other EPA toxaphene or polychloro camphene contaminated sites?

> Secondly, in an effort to keep the project moving forward, and as stated in the Site Management Plan and re-iterated in the Work Plan, Hercules and EPA agreed to perform a Focused RI/FS for OU1 that may allow for the selection of a remedy that is not reliant on the toxaphene analytical methodology, toxicity reference value development, or development of numeric risk-based clean up goals. The remedial action objective defined for the unit would be a narrative, performance based goal (i.e. protectiveness achieved via pathway elimination) versus numerical risk-based concentrations.

Is there any documentation of the Hercules and EPA agreement to abandon a numeric risk-based cleanup goal?

Were the Remedial Investigation Work Plans sufficient to evaluate pathway elimination via removal of the contamination from the Outfall Ditch?

Was the only option the Remedial Investigation Work Plans would fully support the covering of wastes in place and limited sediment removal?

What are the ramifications to the community from leaving the chemical contamination in place, both economically and from an Environmental Justice standpoint?

What inputs from the City of Brunswick Master Plan, Community Development, or the Commission did the EPA factor into the Proposed Plan, and how did these shape the decision-making of the EPA?

> Third, there is no universal remedy applicable to all sediment sites and many risk management decisions for sediment sites include a combination of remedial options. EPA is correct that **Hercules previously performed a large scale dredging operation in the Outfall Ditch in 1999/2000. A substantial decrease in fish tissue concentrations was observed following these removal actions** (Maruya et al, 2005). The selected remedy for the Outfall Ditch should complement the dredging previously performed with the overall goal of achieving further reductions in fish tissue concentrations in the Terry and Dupree Creek system. We believe the alternatives presented in the Focused RI/FS Report complement the removal action previously performed in the Outfall Ditch.

If removal of the contaminated sediments resulted in the desired substantial decrease in fish tissue concentrations following the removal action, why is the EPA considering an unproven approach with the potential to fail?

Why is the EPA considering a Proposed Plan that will essentially forever limit the economic potential of the Brunswick waterfront?

> Finally, other than the no action alternative, some limited sediment removal is included in all of the evaluated alternatives. However, at EPA's request, a new alternative has been added to the Focused RI/FS Report that includes a dredging option to remove sediments from the Outfall Ditch.

On what date was the dredge option to remove sediments (Alternative 2) from the Outfall Ditch added to the Feasibility Study?

Was the dredge option to remove sediments from the Outfall Ditch added to the Feasibility Study to make it appear more than limited sediment removal and covering up the waste was considered?

Does the Administrative Record support the conclusion that the only remedial action considered was limited sediment removal and covering of the remaining wastes?

Is the Proposed Plan a summary of the option considered to implement the pre-determined EPA/Hercules Agreement?

> Comment 2 - The draft RI/FS does not include any human health risk assessment discussion.
>
> Hercules Response to EPA General Comment 2 - Consistent with the Work Plan and subsequent March 2011 Response to Comments letter, the risk assessment was specific to ecological receptors in order to maintain the focused nature of the RI/FS.
> There are currently fish consumption advisories for Terry and Dupree creeks based on fish tissue contaminant levels, including toxaphene. Thus, as a known source of toxaphene, OU1 poses an **indirect risk to human health**. (emphasis added)

Why is the human health risk assessment not discussed?

What institutional controls or environmental controls are the EPA or Hercules implementing to address the human health risk from consumption of contaminated seafood?

As a "…as a known source of toxaphene…" does OU1 poses an <u>indirect</u> risk to human health or is this a <u>completed exposure route</u> via seafood consumption?

Did the Agency for Toxic Substance and Disease Registry (ATSDR) produce a Public Health Assessment (PHA), discuss seafood consumption in the PHA, and make recommendations? What were the recommendations and have they been implemented?

> Specific Comment No. 6: Section 2.1, Page 12: Does sampling data exists which confirms lack of toxaphene contamination in the Trailer Park area?
>
> Hercules Response: This comment is beyond the scope of the OU1 RI/FS, however, Hercules is aware of sampling data within the Trailer Park from 1995 performed by Black & Veatch, as part of the in the Expanded Site Investigation. This data shows a number of samples (N=19) collected from this area. **Concentrations vary from non-detect (N=11), ≤ 2 mg/kg (N=5), to one location with 3 samples with concentrations ranging from 6 to 11 mg/kg.**
>
> EPA and Hercules agreed to not consider the Trailer Park as part of the RI due the fact that dredged spoils were placed in the Trailer Park area before the production of toxaphene. From the 2000 RI/FS Work Plan: "The Trailer Park Area was used for Dredge Spoil disposal prior to 1950. Since dredging in the 1940's ended in 1946, before toxaphene production began, the Trailer Park Area was built before toxaphene contaminated soil was dredged from Terry Creek [U.S. Army Corps of Engineers, September 1997**]. Thus, this area will not be considered during the RI."** (emphasis added)

The Hercules comment is similar to the comments concerning dioxin never being produced at the Hercules Plant. This is denial in the face of overwhelming scientific evidence to the contrary. The EPA should not let Hercules eliminate areas from the Terry Creek Site based upon unsubstantiated claims and in the face of contradictory data.

Will the EPA affirm the Trailer Park is contaminated and retain the area as part of the Terry Creek Site and future Remedial Investigations?

> Specific Comment No. 18:
> Section 8.3.4, Pages 59-60: Screening of in-situ technologies such as in-situ solidification/stabilization or in-situ chemical reduction still is not included as requested by EPA in previous comments on the RI/FS Work Plan and the Remedial Alternative Screening Technical Memorandum. Hercules stated that in-situ treatment technologies would be screened in the 7/23/10 response to comments on the RI/FS Work Plan.
>
> Hercules Response: Previously, Hercules incorporated a carbon amended sand cap as an alternative in the Focused RI/FS in response to EPA comments to include an in situ treatment technology. The sand cap would create a barrier between overlying materials and underlying sediment. The addition of granular activated carbon (GAC) to the sand cap was intended to promote the sorption and permanent in situ sequestration of hydrophobic organic contaminants, similar in concept to cement-based solidification/stabilization technologies.

Does the EPA agree the Hercules response is "unresponsive" and does not address the problem being identified by the EPA, which is: "Screening of in-situ technologies such as in-situ solidification/stabilization or in-situ chemical reduction still is not included as requested by EPA in previous comments on the RI/FS Work Plan and the Remedial Alternative Screening Technical Memorandum"?

Why are the in-situ technologies such as in-situ solidification/stabilization or in-situ chemical reduction still is not included in the Proposed Plan for the Outfall Ditch?

> EPD General Comment No. 3:
> The recommended Option 3 does not appear to provide significant control of the sediment that will remain in the existing Outfall Ditch**. A soil cover with rip rap on top would be highly susceptible to storm surges, high tidal influences, and rising sea levels over time. Additionally, man-made activities that may occur in the area could easily alter the cover and cause sediment dispersal and contaminant release back into the creek. A final concrete cover over the remaining sediment, similar to the concrete culvert within the Outfall Ditch as mentioned in Option 3A, or a solidification/stabilization procedure on the remaining sediment would be an improvement to a soil/rip rap cover.** Provide detailed discussion on these options.
>
> Hercules Response: … Additionally, as described in the alternative description, **land use controls would be implemented to prevent manmade activities from occurring** that would jeopardize the integrity of the remedy. (emphasis added)

Is the Hercules response "unresponsive' to the EPA comment by failing to address, "**A soil cover with rip rap on top would be highly susceptible to storm surges, high tidal influences, and rising sea levels over time. Additionally, man-made activities that may occur in the area could easily alter the cover and cause sediment dispersal and contaminant release back into the creek."?**

Did the EPA contact the City of Brunswick concerning Hercules proposed land use controls which would be implemented to prevent manmade activities from occurring, and the implication of such a decision upon future planning and development, and economic ramifications? If so, on what dates this these communications take place and with whom?

> EPD General Comment No. 5:
> Although corrective actions have been completed at the "N" ditch and toxaphene plant, remaining sources of toxaphene contamination remain in soils that surround the facility. These contaminants have the potential to be washed overland to the Outfall Ditch or to migrate horizontally in the groundwater and discharge to the Outfall Ditch. Until all of the toxaphene sources at the facility have been addressed, the potential for toxaphene to **be released to the existing Outfall Ditch or a rerouted Outfall Ditch will exist. National Pollution Discharge Elimination System (NPDES) permit sampling has also recorded toxaphene within the last year.**
>
> Hercules Response:
> The RCRA Corrective Action Program was completed in January 2010 **and all major sources of toxaphene** in soils have been removed. Hercules **acknowledges that there may be de minimis amounts of toxaphene remaining in soils**, however, these are being monitored for via NPDES sampling and controlled with upland BMPs at the plant. Sporadic, low concentrations detections of toxaphene do not demonstrate that the N Street Ditch is an ongoing source of toxaphene. (emphasis added

What action is the EPA taking to assure continued releases of toxaphene do not occur from the former Hercules Plant?

What level of toxaphene constitutes "de mimimis" amounts?

What is the range of levels of toxaphene wastes on the former Hercules Plant Site in sediments, soil, and groundwater?

> EPD Specific Comment No. 5:
> Section 7.3 SLERA Summary and SMDP
> The rationale presented for **not performing a BERA is insufficient and unjustifiable**. This section states, "Given the magnitude of HQs for toxaphene, it is unlikely that the potential for ecological risk can be attributed to the conservative assumptions or uncertainties of the SLERA discussed in Section 4.4 of the SLERA in Appendix E. …it is unlikely that a BERA will provide significant refinement of potential risks predicted by the SLERA approach or contribute useful information for remedial actions at the Outfall

> Ditch." Based on review of the site-specific information and estimated hazards, the EPD does not concur with the conclusions of the report. Pursuant to the ERAGS document, there is an 8-Step process that should ensue which further refines and characterizes risk for the Outfall Ditch. Based on the results of Table 7-1, several constituents had an HQ greater than 1. The EPD is recommending the site move forward to Step 3 of the Ecological Risk Assessment (ERA). The site may also elect to move to Step 8 which involves balancing risk reductions associated with remediation of the site with the potential effects of the remediation itself.
>
> Hercules Response:
> Human health and ecological risks will be evaluated in detail during the implementation of the RI/FS for OU2 and OU3. However, as stated in the Site Management Plan, due to the analytical methodology issues associated with toxaphene and in an effort to keep the project moving forward, Hercules and EPA agreed to perform a Focused RI/FS for OU1 that may allow for the selection of a remedy that is not reliant on the toxaphene analytical methodology, toxicity reference value development, or development of numeric risk-based clean up goals. The remedial action objective defined for the unit would be a narrative, performance based goal (i.e. protectiveness achieved via pathway elimination) versus numerical risk-based concentrations. Further, the approved Focused RI/FS Work Plan described the likelihood that the focused SLERA would result in significantly elevated ecological Hazard Quotients for both sediment and surface water and that potential ecological risks would be addressed through a performance-based remedy that achieves ecological protectiveness through the elimination of exposure pathways for ecological receptors in OU1. (emphasis added)

The lack of any ecological data is startling. The Glynn Environmental Coalition agrees with the Georgia Environmental Protection Division (GA-EPD) in that, "The rationale presented for not performing a BERA is insufficient and unjustifiable." Not only is it unjustifiable, but the lack of any observed toxicity data or any other ecological data to get an idea about the state of the ecological health of the Terry Creek area questions the competence of all involved with the Terry Creek Site. The GA-EPD should be protesting, and the EPA should be taking action immediately to have the data obtained, regardless of whether Hercules feels it is needed or not. Obviously, Hercules is in a time-warp and not cognoscente about generations of people eating seafood contaminated with the poison so proudly patented by Hercules as polychloro camphene.

Will the EPA order Hercules to obtain ecological samples, perform observed toxicity sampling, or have the work completed and bill the Responsible Party as the EPA has the power to do under CERCLA?

Has the Remedial Investigation and Feasibility Study been modified to address the comments by the GA-EPD?

What ecological sampling, other than seafood, does the EPA have scheduled for the Terry Creek Site?

In detail, what are the institutional controls being implemented to address human consumption of seafood from the Terry Creek, Dupree Creek, and Back River fishing areas?

NOAA Resource Damages Claim

Noted in the Administrative Record for the Terry Creek Site Proposed Plan is the April 7, 1995 – Letter from Douglas F. Mundrick, Chief, South Superfund Remedial Branch USEPA Region IV, from Harold Reheis, GA-EPD Director concerning Terry Creek Resource Damages Claim. The Resource Damages Claim process at the Terry Creek Site was initiated in 1995.

Has the EPA taken the data needs of the National Oceanic and Atmospheric Administration (NOAA) for the Resource Damages Claim into consideration when developing remedial investigation plans?

What data has the EPA included in the Remedial Investigation, Feasibility Study, or Remedial Design in support of the Resource Damages Claim?

Has the EPA stayed in contact with the Resource Damages Claim stakeholder agencies and addressed sampling and analysis needed for a National Resource Damages Assessment (NRDA)?

Terry Creek 2006 T 040 302bD2C 049LCO00, 009 Landfill 2006 T 040 302DD2C 0425FE00, March 2006 - Update for the RA Re : 009 Audit. Toxaphene. and Brunswick

6. EPD's RCRA Correction Action at the Hercules Brunswick facility is dependent on Region 4's lead concerning toxaphene. The Region is in contact with EPD.

Why is EPD's RCRA Correction Action at the Hercules Brunswick facility is dependent on Region 4's lead concerning toxaphene? Please explain in detail.

What was EPA Region 4's lead concerning toxaphene and what action did it entail, and what action did EPA Region 4 take since 2006 in this lead role?

Was EPA Region 4 the lead to establish the Toxaphene Task Force, Method 1, as the analytical method for the former Hercules Plant site and the Terry Creek Site?

What is the EPA Region 4 involvement in the former Hercules Plant RCRA investigation and remedial activities?

9. The Program anticipates an upcoming high level of interaction with EPA National, ATSDR and Hercules concerning the validation of the 'new method' and continued efforts to evaluate human health risk. Hercules has proposed a national panel with an intent to move the best available science forward. Both these efforts will take place while the Program executes the interim strategy outlined above.

What were the EPA Region 4 efforts to evaluate human health risk?

What were the results of EPA Region 4's efforts to evaluate human health risk?

Was a national panel with intent to move the best available science forward formed, as proposed by Hercules? If so, what were the results and were the results implemented by Hercules or the EPA?

> 10. Kiwanis Club of Brunswick, the Brunswick News, and the GEC have all requested an audience with the Region concerning toxaphene and have been put on hold until the March 22nd completion date of the Response to the OIG Audit at 009, In the event of another extension, the Region will continue to hold the course.

While the community was "…put on hold…" by EPA Region 4, did the EPA continue to meet with Hercules or their consultants and contractors? If so, on what dates did these meetings take place and are records from these meetings in the Administrative Record for the Terry Creek Site?

> Immediate Steps Forward:
> 1. Write Extension letter to the OIG after receiving Hercules' request.
> 2. Provide FYI copy of our Response to the Final Audit at 009
> 3. Obtain the delivery status of Hercules' comments to the Final Audit at 009.

Do the EPA Region 4 records appear to be centered around meetings with Hercules and avoiding meetings with the community?

Were the requests from Hercules acted upon during the first quarter of 2006 while the requests from the community were put on hold?

Was the extension of the time period to respond to the EPA Office of Inspector General by EPA Region 4 in response to a request by Hercules?

Did EPA Region 4 and Hercules work closely or together to formulate a response to the EPA Office of Inspector General?

At what point in time did the Weinberg Group become involved in the Terry Creek Site?

Did the Weinberg Group help formulate the arguments being put forth by the EPA and Hercules in the Proposed Plan for the Terry Creek Site?

> **EPA COMMENTS ON THE PRELIMINARY DRAFT FOCUSED REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN OPERABLE UNIT 1 (OUl): OUTFALL DITCH TERRY CREEK DREDGE SPOILS/HERCULES OUTFALL BRUNSWICK, GEORGIA**
> **MAY 2010**

> EPA Comment - 2. There are multiple references in the plan that state the purpose of the focused remedial investigation/feasibility study (RI/FS) is to develop alternatives to achieve protectiveness via pathway elimination/physical isolation/capping (see pages 15, 16, and 19). **The plan should not predetermine a remedy**, and these references should be removed. EPA notes that section 6.3 does include multiple remedial options including no further action, removal, and containment. The plan should also evaluate monitored natural recovery and in-situ treatment options. (emphasis added)

Why were the In-Situ options not presented in the RI/FS?

Did EPA Region 4 repeatedly tell Hercules to include the In-Situ option for consideration and evaluation in the RI/FS?

Was there an agreement between the EPA and Hercules after these comments to eliminate In-Situ as an option?

Were in-situ options presented in the Outfall Ditch Proposed Plan? If Not, why not?

> EPA Comment - 6. The suitability and accuracy of the **task force method for toxaphene has been questioned due to its inability to detect or underestimate toxaphene** concentrations. Therefore Method 1 and Method 2 should not be solely relied on. It is indicated in the work plan that the GC-ECD/NIMS method will be used for a limited number of samples only for information purposes. As of this writing, the GC-NIMS Method 8276 for the toxaphene **congeners is an official EPA method and should be utilized on a larger scale**. (emphasis added)

Why was the discredited Toxaphene Task Force (TTF) method the primary guiding analytical method for the RI/FS?

Did the EPA note, "…the task force method for toxaphene has been questioned due to its inability to detect or underestimate toxaphene concentrations"?

When did the EPA approve the TTF method for use at the Terry Creek Site for the 2014 RI/FS?

Does the EPA agree Method 8276 is an official EPA analytical method?

Did the EPA recommend Method 8276 be utilized on a larger scale at the Terry Creek Site?

Were there agreements between the EPA and Hercules to minimize use of EPA Method 8276? If so, when were the agreements made and where can the documentation be found?

If there were not agreements, please explain how and why a Remedial Investigation and Feasibility Study progressed to the Proposed Plan stage without data produced under the EPA approved analytical method?

<u>August 12, 2014 letter from GA-EPD to Mr. Timothy D. Hassett, Hercules</u>

GA-EPD Comment 1. The document does not present any assessment-specific endpoints for the protection of fish and other aquatic biota and plants from contaminants associated with sediments in the Outfall Ditch even though the screening-level estimates for multiple contaminants indicate that further evaluation may be necessary to assess the potential for adverse impacts to these receptors. It is pertinent that the RI/FS provide ecological endpoints to aid in risk management decision-making.

What are the ecological end point being targeted by the RI/FS for OU1?

What is the level of ecological and human health risk the RI/FS expects to achieve?

Over what time period are the expected reductions in ecological health risks expected to take place?

Over what time period are the human health risk reductions expected to be obtained?

Does the EPA have guidance documents for fish advisories driven by polychloro camphene (also known as toxaphene) (EPA 1999)?

Does the EPA fact sheet, "Toxaphene Update: Impact on Fish Advisories" have data to set remedial goals for seafood (EPA, 1999)?

Does the EPA also have fact sheets concerning fish consumption for dioxins/furans, mercury, and PCBs?

Does the EPA have data from fish from Terry Creek for dioxins/furans, mercury, and PCBs?

Have dioxins/furans, mercury, and PCBs been found in Terry and Dupree Creek sediments?

If so, has the EPA evaluated the polychloro camphene, dioxins/furans, mercury, and PCBs in developing the seafood consumption advisory for Terry and Dupree Creeks, and the surrounding area?

EPA Comment • Provide the regulatory framework for the project, identify lead regulatory agency, identify stakeholders and input to key decisions.

Who are the stakeholders referred to in the above statement?

AR Document 10784170, Doc Date 10/06/1999, A RE-EVALUATION OF FISH ADVISORIES BASED ON WEATHERED TOXAPHENE IN FISH AND CHANGING LEVELS OF TOXAPHENE RESIDUES IN FISH NEAR BRUNSWICK, GA

> The 2006 EPD fish advisories are based on the use of the cancer slope factor for technical toxaphene provided in EPA's toxicity database, the Integrated Risk Information System (IRIS). The fish advisories presented in this report as considerably less stringent.

Has the EPA IRIS database been used to set fish advisories in Terry Creek?

Is the EPA IRIS database the current document used to set fish advisories in Terry Creek? If not, why not?

> The major factor driving the reduction in fish advisory levels is the use of a new reference dose for weathered toxaphene. The development of this reference dose was presented in Simon and Manning (2006) and is supported by work performed by European Union scientists in support of the European Union report "Monitoring, Analysis, and Toxicity of Toxaphene" (MATT, 2000). The European scientists who developed MATT (2000) have recently submitted for peer review and publication the animal testing work supporting the development of the reference dose in Simon and Manning (2006).

What are the differences in the seafood consumption advisories before and after the application of, "…major factor driving the reduction in fish advisory levels is the use of a new reference dose for weathered toxaphene"?

What is the definition of the term "weathered toxaphene" referenced in this document in terms of the polychloro camphene by chlorine weight, number of chlorine per camphene, and mole weight?

Did the EPA abandon using the IRIS database for fish consumption advisories? Was the change only in EPA Region 4?

Does Simon and Manning (2006) base their speculation on polychloro camphene manufacturing wastes?

Were the MATT, 2000, fish dosed with polychloro camphene manufacturing wastes?

What is the relevance of Simon and Manning (2006) to the ecological risk assessments?

Does Ted Simon list the Weinberg Group as one of his clients?

Was Simon and Manning (2006) written while Ted Simon was working for EPA Region 4?

Was Ted Simon working for the EPA and Hercules (or one of Hercules' consulting firms) when Simon and Manning (2006) was written or when published?

> If this high concentration sample is removed from the calculation, no advisory is needed.

Does the EPA advocate for the removal of seafood sampling data in order to eliminate consumption advisories?

Who hired Ted Simon to produce this report?

Who paid Ted Simon to produce this report?

> The use of this reference dose indicates that the weathered toxaphene in fish around Terry and Dupree is about twenty to eighty fold less toxic than suggested by the cancer slope factor on IRIS (USEPA, 1991).

Did EPA Region 4 use the recommendations presented by Ted Simon or use the EPA IRIS database for seafood advisories in the Terry Creek Area from 2006 until now, or at any time?

Did EPA Region 4 use the recommendation presented by Ted Simon in any way at the Terry Creek Site?

> It is important to note that reductions in fish advisories are also based on different analytical results. Those published by DNR are based on analyses of total toxaphene whereas those presented in this report are based on the sum of the concentrations of p-26, p-50 and p-62 or ∑3PC.

Does the EPA recommend using total toxaphene for seafood advisories?

What are the seafood advisories based upon the total toxaphene and,"…those presented in this report…"?

What are the quantified differences between the two methods when applied to seafood advisories?

Did the method proposed by Ted Simon only address the carcinogenic risks from the polychloro camphene in seafood from Terry Creek or include non-carcinogenic risks, too?

Did Ted Simon address non-cancer risk to the kidney, liver, children, and pregnant women?

Did Ted Simon include the additive effects from the other chemicals like dioxin/furans, mercury, PCBs (and Aroclor 1268 in particular) and the implications for added cancer risk and other non-carcinogenic risks?

Were the results of Simons and Manning, 2006 the discussion of data produced by others with no data of their own, or any data from the Terry Creek site which included the full scope of contaminants?

> **Toxaphene - Terry Creek, Brunswick, Georgia H. T. DeRigo, Biologist, Env Res. Sec, 16 June 1971**
>
> 2. I was informed by telephone this morning by Mr. Ledbetter, Georgia Water Quality Control Board, that in 1966 the discharges from the Hercules Power Company, released into Dupree Creek, contained approximately 230-300 pounds of Toxaphene per day. Under an abatement program, the company still discharges a fair amount of the insecticide to the ecosystem. However, with the completion of their treatment in 1972, the amount of Toxaphene will be reduced to less than one pound per day.

Using the estimate above, what is the quantity of toxaphene pesticide released to Terry and Dupree creeks?

In addition to the toxaphene pesticide released, what was the quantity of other manufacturing wastes and the composition of these wastes over the past 106 years?

Have a vertical profile cores been taken from the Outfall Ditch to characterize the scope of chemicals deposited in the ditch over the 106 year history of the ditch being used for chemical plant wastes? If not, why not?

Weinberg Group, Hercules, and Science for Sale

> **The Science Fraud Industry: Weinberg Group Inc.— September 16, 2014**
>
> There are "scientific" consulting firms that are hired by the makers of such products to "help . . . deal with scientific questions about the safety or health consequences of their products." In short, they produce fraud science asserting that dangerous products are safe.
>
> There are a few firms, but among the worst is the Weinberg Group. Weinberg has been hired by DuPont, the tobacco industry, makers of Agent Orange, and makers of asbestos to "develop legal defense campaigns, ostensibly based on science, to sway juries during trials, to counteract potential regulatory oversight, and to influence [public opinion] about the health effects of products," reported Environmental Science & Technology Online News (ES&T).
>
> A 2003 letter that was confirmed to authenticate a relationship between Weinberg and DuPont illustrates Weinberg's practice of falsifying science and purchase of scientific opinion.
>
> P. Terrence Gaffney, Esq., VP of Product Defense at Weinberg, wrote Jane Brooks, VP of Special Initiatives at DuPont, to explain to her how his company will purchase scientific opinion to avoid regulation and legal action concerning DuPont's

perfluorochemicals (PFCs), a heat resistant chemical found in fabrics, teflon, and food wrappers and containers.
http://ringoffireradio.com/2014/09/the-science-fraud-industry-weinberg-group-inc/

The appearance of the Weinberg Group and the timing of their appearance into the Terry Creek Site records should be examined. The product of the Weinberg Group is well known, and appears to have firmly interjected their brand of science into the Terry Creek Site records, as have the unseemly characters who provide their services to this consulting firm of ill repute.

The tactics and services provided to Dupont appear to have been provided to Hercules and whole-heartedly embraced by EPA Region 4 instead of rejecting and expunging them from the Administrative Record for the Terry Creek Site.

The antics of the Weinberg Group are now legendary. The Weinberg Group has been exposed for what they are and do. But, the legacy of these despicable practices lives on in dark places that still need to be brought into the light of day. These practices need the disinfection of the sun of day.

The Weinberg Group emerges on the scene in EPA communications by March 2006 as a consultant to Hercules.

Did the Weinberg Group either directly or through Hercules provide the EPA Region 4 response to the EPA Office of Inspector General (EPA OIG) concerning the report, Appropriate Testing and Timely Reporting Are Needed at the Hercules 009 Landfill Superfund Site, Brunswick, Georgia?

Was Ted Simons working for the Weinberg Group when the Simon and Manning, 2006 paper was written?

Reference to the Weinberg Group producing the toxaphene toxicological work appear in August 2007 EPA email communications and the EPA's August 13, 2007, "Path Forward" for the Terry Creek Dredge Spoils, Brunswick, Georgia. In the August 20, 2007 EPA Briefing Summary for the EPA Regional Administrator, Hercules and the Weinberg Group were reported as undertaking the toxicological study for.

By the December 13, 2007 Briefing Summary to the EPA Regional Administrator, Hercules and the Weinberg Group were reported as undertaking the toxicity analysis.

On August 21, 2007, Dr. James C. Lamb from the Weinberg Group presented their plan via Power Point for Toxaphene Risk Assessment: re-Evaluation and Data Development. As part of the Power Point presentation, a Scientific Advisory Panel (SAP) was listed, including Dr. Ted Simon.

Was Dr. Ted Simon hired or contracted by the Weinberg Group or through Hercules to work with the Weinberg Group?

Is this why Dr. Ted Simon lists the Weinberg Group as one of his clients (http://ted.wixsimon.com/clients/)?

Was "weathered toxaphene" defined by the Weinberg Group as P26, P50, P62, HxSed, HpSed, and mixtures to model weathered toxaphene?

What were the "mixtures to model weathered toxaphene" referenced in the Weinberg Group Power Point?

What is the definition of "weathered toxaphene" presented by the Weinberg Group?

Did EPA Region 4 adopt the "weathered toxaphene" definition presented by the Weinberg Group?

If EPA Region 4 did not adopt the definition of "weathered toxaphene" presented by the Weinberg Group, what is EPA Region 4's definition of "weathered toxaphene" by chemical composition, chlorine weight of the polychloro camphene, and any other metrics to define what comprises "weathered toxaphene"?

Does all the "weathered toxaphene" fall under the Hercules patent for polychloro camphene, and if not, which chemicals do not fall under the patent but are considered "weathered toxaphene"?

Administrative Record - Account Number: DT 2007 T 04D 302DD2C 049LBD0 - 2007 –

Is Hercules Inc., noted as have hired the Weinberg Group to develop toxicity information relating to toxaphene breakdown products?

What is the definition of "breakdown products"?

What is the specific chemical composition of the group of polychloro camphene defined as "breakdown products" for which the Weinberg Group was developing toxicity information?

Did EPA Region 4 receive work plans for these toxicity studies?

Are the work plans for the toxaphene breakdown products toxicity studies in the Terry Creek Site Administrative Record?

Were these toxicity studies of toxaphene breakdown products ever completed? If not, why not?

If not, why does the EPA still reference these toxicity studies in the Proposed Plan many years after projected completion date in 2011?

Congress: Science for Sale?
Feb. 6, 2008, By JUSTIN ROOD http://abcnews.go.com/Blotter/story?id=4252096

Congress is investigating a Washington, D.C.-based firm which critics charge "manufactures uncertainty" on behalf of chemical companies to help keep their products free from government bans or other restrictions.

"The tactics apparently employed by the Weinberg Group raise serious questions about whether science is for sale at these consulting groups," said Rep. John Dingell, D-Mich., chair of the Energy and Commerce Committee, in a statement Wednesday. His panel is heading up the probe.

Did the Weinberg Group come under investigation by the Energy and Commerce Committee for a "Science for Sale" scheme in 2008?

Is it true that the Weinberg Group wrote, "We will harness...the scientific and intellectual capital of our company with one goal in mind -- creating the outcome our client desires"?

Why is any mention of the Weinberg Group not found in the Administrative Record after February 2008?

Were the toxicological studies the Weinberg group was working on ever completed?

Was another firm contracted to complete the toxicological studies work since 2008?

If not, why is the lack of this data being cited in the Proposed Plan as the reason to not move forward with risk-based remedies at the Terry Creek Site?