Recd. 7/31/0

As a landowner, taxpayer and parent in Bridgeton, Missouri I have several concerns regarding the preferred option discussed at a recent public meeting at our local civic center.

The Baseline Risk Assessment (BRA) for Westlake Landfill Operable Unit 1 dated April 24, 2000 by Auxier & Associates. One of my primary concerns Is that the BRA was developed by the "respondents." It represents a significant conflict of interest that the parties/respondents legally responsible for cleaning up the illegally dumped radioactive materials developed the BRA. Any proposed action from this assessment would be contaminated, poisoned fruit from the contaminated, poisoned tree.

This BRA should be given NO WEIGHT in the remediation process or the Record of Decision (ROD) for Westlake Landfill remediation. Page A.1-3 clearly states that "*the BRA* (will) . . . *help support selection of the "no-action" alternative* (if appropriate)."

The administrative order or consent (AOC) between the U.S. EPA and the sources of contamination, the respondents, who should be financially responsible for proper disposal and remediation tilts the decision making towards the benefit of the clients (the respondents) rather than the local citizens impacted on currently and all the other stakeholders both now and in the future. It appears as if the Fox in developing the BRA (EPA 1992a) is in charge of cleaning up the hen house with the expectation that taxpayers will pay the bill and that Bridgeton and Missouri residents will endure the health risks and environmental impact for future generations and millions of years. In allowing Cotter Corporation to develop the BRA U.S. EPA is putting the Fox in charge of the Hen House and expecting the chickens to pay the bills. Cotter (that was a wholly owned subsidiary of Commonwealth Edison - now Excelon) is a Potentially Responsible Party (PRP) as are the other respondents.

Page A.2-4 indicates that the high levels of U 235 are "*higher than one would expect*," indicates a significant lack of institutional memory and/or control. Higher levels of U 235 are exactly what a reasonable person would expect given the significant amounts of Congo Pitchblende in these wastes. One would expect higher concentrations of U-235 and its daughter products from Belgian Congo Pitchblende which was the source of these

illegally dumped radioactive contaminants. Given the history of these wastes there is no logical or scientific basis for concluding that "*the U-235 characterization results are not reliable*." In fact all the historic evidence indicate that one would reasonably expect to find high U - 235 and daughter products.

The very beginning of the Atomic age can be traced to the St. Louis area. In 1942 Uranium was processed here for the Manhattan Engineering District. We are still cleaning up the waste from the first self-sustaining nuclear reaction in the world. The uranium for the Fermi Pile at the University of Chicago was processed here at Mallinckrodt and Destrahan in North St. Louis. The uranium for the first atomic bombs was processed here, irradiated workers and now contaminates 7 sites in the St. Louis area. Workers here are just now being compensated for the cancer associated with these wastes. The Mallinckrodt, Airport Site, Latty Ave., Weldon Spring, Quarry, Westlake landfill are all contaminated with these associated wastes.

These Belgian Congo ores received by Mallinckrodt from African Metals Corporation of Belgium (AMCB). These wastes associated with the Manhattan Engineering District and the highly radioactive Belgian Congo Pitchblende are the very reason Cotter Corporation transported some of these same wastes to Colorado. From 1946 for 11 years mixed wastes and residues were transported to the Airport (SLAPS) site. The SLAPS site was also known to contain a truck, drums, sludges, dusty particulate materials and various equipment. Some of these same "wastes" and "residues" that were acquired by Cotter Corporation were transported from the Airport site to Latty Avenue and then to Westlake B&K Construction and possibly other haulers. It is known that B&K Construction Company deposited some of these same Cotter Corporation U - 235 containing wastes at Westlake in 1973.

The process for these waste indicate that Barium was precipitated as Barium Sulfate, along with Lead Sulfate from a Nitric Acid dissolution of the ore. Barium was added to the solution from which the Radium had been precipitated causing the precipitation of Barium Sulfate - which scavenged residual Radium Sulfate from the Uranium solution. Consequently the resulting wastes contain residues from the aqueous waste stream, insoluble sulfate salts, slimes and sand. Most ot the Radium - 226 would be contained in the slimes. The Radium and Thorium associated with the wastes don't present as pure

sulfates and salts. They may move by dissolution to produce ions and/or as undisolved particulates (according to a 1995 National Research Council/National Academy of Sciences report).

The "residues" contain U 238 and U 235 daughters in their decay chain. Extraction also resulted in some of the Th 230 from their residues. Which may be the source of the hotspots of "enriched" thorium. These wastes would also be expected to contain unseperated uranium, barium, lead, molybdenum, and rare earth elements and noble metals. In addition there would be other "wastes" with Ra 226 and Th 230. These wastes have a much higher concentration of Ra 226 than typical Uranium ore or tailings from the United States.

The original Belgium ores from which these Westlake wastes were derived had Uranium concentrations ranging from 35 to 60 % U 3 O 8 while typical American Uranium ores from the U. S. Southwest range from 0.2 to 0.4 U 3 O 8 . The levels of Ra 226 and U 235 would be expected to be remarkably high.

BRA Page A. 2-4 voices confusion on the high concentration of U 235 and draws the erroneous conclusion that the U 235 results were not reliable. Dismissing data because you don't agree with the results is not logical. *"Naturally - occurring proportions"* expected for American Uranium does not apply to the Belgian Uranium ore which is the source of theses wastes.

Even a superficial and cursory knowledge of the institutional mishandling of these wastes would lead to a reasonable expectation that Auxier & Associates should find U 235 and its daughter products. It would be surprising if the wastes did not have U 235.

Radioactive Materials in the Westlake Landfill (U.S. NRC, Nureg - 1308 Rev. I, June 1988) finds on page 6 that the hydrology of the site is on a *"floodplain," "highly permeable"* and that *"contamination of the bedrock aquifer is possible."* It also finds that U - 235 is found at .7% in nature but is found at 60-65 % in Congo Pitchblende. It also finds Protactinium 231 ranked #1 in radiotoxicity an Actinium - 227 another highly radiotoxic element. Thorium - 228, Thorium 230, Radium -226, Lead -210 and U - 238 are also found at the site. A Basic Toxicity Classification of Radionuclides, Technical Reports Series #15, by the International Atomic Energy Agency Vienna 1963 list several of the materials at Westlake as highly radiotoxic. Allen Brodsky's Health Physics report in

June 1965 lists Thorium - 230 and AC 227 as among the most radiotoxic radioactive materials. Radiological Survey (U.S. NRC Nureg / CR- 2722 May 1982) finds the presence of radioactive gas. Detectable levels of Radon - 219 has a short half life but is highly radiotoxic.

Page 15 of Nureg - 1308 lists the presence of Th - 230 and Ra - 226 and states, "*indicating a significant increase in the radiological hazards in the years and centuries to come . . . (monitoring wells show) contamination of groundwater is occurring.*" U.S. NRC Nureg - 1308 on Page 12 says that because of the high levels of Thorium - 230 and Radium - 226 in these wastes on - site disposal would requires "*digging up and moving material to a carefully designed and constructed disposal cell.*"

U.S. NRC Nureg/ CR 2722 , May 1982, characterizes the Westlake wastes contamination as up to "*15 acres up to 20 feet below*" and states 1977 and 1978 monitoring wells showed movement contaminants. It states that these Cotter Corporation wastes were moved to Westlake in 1973 and that there is a large discrepancy in the amount of material dumped there . . . "*the exact amounts of Isotopes of Concern was unknown.*" Ra 223, Ra 224 , Ra 226, and Alpha emitters Rn 219, Rn 220 and Rn 222 are listed as Isotopes of concern that are present in unknown quantities. Nureg/ CR 2722 on Page 13 found off-site levels of 2 pCi/g of Ra - 226 and on site levels ranging from "*1 - 21,000 pCi/g of Ra - 226, ' up to 2,100 pCi/g of U-238, and "elevated sample activity" of daughter products of "both U - 238 and U - 235.*" Page 14 remarks on the "*high levels of Th - 230. Page 15 finds water monitoring wells with levels of U -238 daughters at more than 19,000 pCi/g.* "

Westlake samples from 1980 and 81 on Page 16 found several water samples exceeding U. S. EPA goss beta drinking water standards. Page 17 list radon gas and daughter contamination, as high as, 858 pCi/sq meter per second while background is 0.2 pCi/ sq meter per second. The maximum permissible standard is 20. Page 18 cites concentrations of Rn- 219 daughter products. Uranium 235 chain daughters are listed on Pages 20 and 21 with "*high*" levels of Thorium 227, 230 and 231 50 x higher than Ra- 226.

Table 4 on Page 58 finds 1981 surface levels of soil of Thorium - 230 at 178,000 pCi/g while background is .2 pCi/g.All samples had "*high levels*" *indicating* "*enrichment of Thorium.*" A quick review data from several sources shows a wide variety and fluctuation

of alpha, beta and gamma counts on and off the Westlake site.

Alpha, beta and gamma emitters are present - November 1980 found external radiation levels in both Westlake areas I and II. Area I had "*>200 uR/hr*" and II had "*>1600 uR/hr.*" Non- gamma emitters such as Th - 230 and airborne Isotopes of Concern are not addressed adequately in the BRA, FS or RIR.

Natural background for gamma is 10 cpm. The Westlake Feasibilty Study (FS) Figure 2-7 shows levels of 760,000 cpm, FS Figure 4-16 ranges from 6,000 to 500,000 cpm. The FS lists the presence of Lead and Barium but does not assess them as non-radiological toxic materials.

Table 1. 2-13 dismisses U 235 (with a background of < .55 p Ci/g) with a figure of 251 pCi/g and uses a calculation based on an arithmetic mean without recognition of these K-65 wastes derived from Belgian ore having a very high concentration of U 235. What are the concentrations of Radon 219 and other U 235
daughters? Why no U - 235 beneath the surface when it occurs at WL 210 at 182 pCi/g? Why did the presenters at the public meeting deny the Belgian ore source of the Westlake U 235 ?

Thorium - 232 (with a half life of 14.5 billion years) is nearly undetectable with a background of 0.5 pCi/g. At Westlake it occurs at 25.8 pCi/g the surface. At 10' deep at WL 234 at 774 pCi/g. Protactinium - 231 at WL 234 had 1050 pCi/g. Actinium - 227 occurs at 952 pCi/g at WL 234 and WL 106 at 305 pCi/g is ranked at #8 in radiotoxicity. Why aren't muatagenesis and tetratogenesis factors considered as health risks - only carcinogenesis?

The continuing high levels of radoactivity, the uncertainties in predicting local geologic and hydrologic conditions, the unpredictable interaction between these mixed rad and toxic wastes and the potential long term risk to the public health and environmental safety argue decisively against on- site storage. The very high concentration of radium and its daughters especially radon and presence of thorium - 230 (with a half-life of 75,400 years.). And uranium 235 and 238 (with half-lives ranging towards the billions of years) tailings and their daughter products indicate an unacceptable radiation exposure risk currently and in the future.

Perpetual care of these wastes requires effective quality assurance and control and effective administrative controls and maintenance and monitoring. The BRA and the history of these wastes present no reason for hope in these areas. The proposed preferred actions by Cotter and the other respondents do not address the above named issues. They do not address the fundamental issue that these highly radioactive residues pose a potential long-term public risk given the current environment and future unpredictability. The hydrology/geology suitability of the site is not addressed and the long periods of time commensurate with the duration of the potential risks is not addressed. The potential interactions on and off site between toxic chemical, landfill and radioactive waste has not been addressed. The historic institutional controls have been lacking. No adequate estimates of costs associated with legal liability, health and environmental monitoring and site integrity for thousands of years is provided. Moving the wastes now is the financially expedient action. Previous non-action has raised the expense from a 1984 estimate of $ 5 million. Removal of the wastes will significantly reduce future impacts on ground water and airborne exposures, as well as, potential complete site failure in 1,000, 2,000 or 4,000 years. Westlake's location in a floodplain in an area subject to earthquake and intense storms (including tornadoes) in a populated area make it unsuitable for rad waste storage.

Option L6 is the only reasonable option. Removal of these highly radioactive wastes to a licensed, state-of- the - art repository at the shared expense of the U.S. Government and the respondents is the only reasonable, best- practices alternative.

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