October 17, 2024

Northgate Park: Commentary by Scott Washington*

I have read the proposal that the engineering firm, S&ME, has submitted to remediate 23 subplots (approximately 100' x 100' in size) across Northgate Park at an estimated preliminary estimated cost of over 2.1+ million dollars to address alleged lead exposure concerns.

If there was actually evidence of "500 truckloads" of potentially hazardous lead infused incinerator cinder buried at Northgate Park on the "east side" (presumably of Ellerbee Creek) and covered with "topsoil" as a 1955 Herald Sun news article alleged, I would be the first one to support S&ME's approach..

There's only one problem.

The evidence does not support that conclusion.

If anything, the slogan that a well-known hamburger chain used in their advertising years ago comes to mind, when trying to find over 300 tons of cinder and topsoil that allegedly was brought to Northgate Park from Walltown Park (the site of a former Durham incinerator in the early 1950s), "Where's the Beef?!"

I suppose that it depends on what you're looking for.

If you believe that 500 truck loads of potentially hazardous incinerator cinder is lurking beneath the surface of Northgate Park, then no strategy is too extreme to address that concern.

To give you an idea of how much 500 "truck loads" would represent, a typical dump truck can hold about 6.5-7.5 tons of dirt. Even if you use the lower side of those numbers, then 500 trucks carrying 6 tons of cinder per truck would equal 300 tons of cinder, and that doesn't count the topsoil the 1955 news article alleges was placed on top of that, nor the sheer cost in hours, and labor needed to deliver and rake it all out.

To give you an idea of scale, 300 tons of cinder would be the equivalent of a football size field of cinder 8 inches deep.

Even if you use a modest 2,000 pounds of cinder per truck, that's still 100 tons of cinder and additional topsoil on top of that.

That's the "Halloween" type specter that confronted Durham City officials when they were made aware of that 1955 article in 2022.

Even though the engineering firm Mid-Atlantic Associates conducted 259 state of the art "real time" X-Ray Florescence (XRF) scans of both sections of Northgate Park north and south of Lavender Avenue in July 2023, and took 32 additional soil samples as well, they could not find any evidence of an alleged vast quantity of potentially hazardous lead infused incinerator cinder buried at Northgate Park.

Mid-Atlantic surmised in their August 18, 2023 report that the slightly elevated levels of lead exposure they did encounter in a few locations might best be explained by the proximity of heavily travelled roads and lead particulates from the exhaust of cars on those roads rather than from underground hazardous waste.

Based on EPA established upper thresholds for lead exposure for normal dedicated child play areas (<400 ppm) and non-play areas (<1200 ppm,) Mid-Atlantic concluded in their August 18, 2023 report:

"*Based on these results, Mid-Atlantic offers the following conclusions: Based on surficial XRF screening, laboratory confirmation testing and field observations, widespread surficial lead impacts to soil do not appear to be present at Northgate Park…which would present a potential exposure risk to the public."*

In other words, the park and play areas were safe to reopen to the public a year ago.

Normally, that would have been welcome news and the start of a "happily ever after" tale.

However, as every child who loves to play on those dedicated play equipment knows, that didn't happen.

What did happen was orange fencing began to go up. Play areas were fenced off. The specter of 500 truckloads of potentially hazardous lead infused incinerator cinder allegedly buried somewhere underneath Northgate Park had not been fully resolved.

Acting out of an abundance of caution, the City of Durham requested that Northgate Park and four other city parks be accepted into North Carolina's "Pre Regulatory Landfill Site" superfund program to address any potential lead exposure issues and expedite remediation as well.

When the Hazardous Waste Division of the North Carolina Department of Environmental Quality (NC DEQ) accepted the five Durham parks into that program, what had been acceptable thresholds for dedicated child play areas also changed. The upper threshold for dedicated child play areas in superfund sites shifted downward to <200 ppm. The upper threshold for non play areas remained the same at <1200 ppm.

When the five Durham parks became part of the “Pre Regulatory Landfill Site” program, they became part of this superfund focus. NC DEQ engaged a second engineering firm, S&ME, to do 12 inch soil bore tests of all five parks in an attempt to determine the extent of any potential lead exposure from buried hazardous waste beneath ground level.

In December 2023 going into January 2024, S&ME (the second engineering firm hired to investigate all five parks), ran hundreds of 12 inch soil bore tests at Northgate Park.

Again, just like Mid-Atlantic Associates had discovered, S&ME also discovered that, contrary to what the 1955 newspaper article alleged, there was no “smoking gun” of literally tons of potentially hazardous lead infused incinerator cinder buried at Northgate Park.

What S&ME did find in their soil bore tests was the kind of uniformity to the soil makeup throughout the park indicative of native soil, including the “east side” of Ellerbee Creek where the 1955 news article alleged that “topsoil” was placed on “500 truckloads” of cinder.

But when S&ME did their soil bore tests, they found no evidence of dark rich topsoil. Instead, they found the same kind of “…***soil cover material <that exists throughout the park that> mostly consists of brown sandy clay and clayey sand”*** (from the March 6, 2024 S&ME report.) That kind of native soil is critical to the ecology of the park, providing a stable basis for roots of wild grasses, shrubs and the trees in that floodplain that help support the stability of the topography alongside Ellerbee Creek, especially when it periodically overflows.

Intentionally disrupting the robust ecology that has existed for millennia to “remediate” subplots that don’t need it by bulldozing, grading, removing trees and grasslands and introducing non native top soil is not without risk to Ellerbee Creek itself and Northgate Park too.

As Ellerbee Creek periodically overflows, much like the Nile River does, topsoil that wasn’t “brown sandy clay and clayey sand” might more easily wash away and with it, the stable floodplain that Ellerbeee Creek and Northgate Park depend on, and by extension, the homes and homeowners surrounding the park, too.

It’s true that there were several subplots that had slightly elevated levels of lead when soil bore tests were undertaken . But the subplots where S&ME got those readings in 12 inch soil bore tests beneath ground level were not the same as Mid-Atlantic’s XRF surface level scans, indirectly confirming what Mid-Atlantic had conjectured: that the surface level source of slightly elevated lead exposure they recorded in July 2023, was most likely caused by lead particulates from the exhaust of cars on heavily traveled

roads near those test sites, over the decades that lead was used in gasoline, rather than from an underground source of buried hazardous lead infused waste.

However, in order to fast track and expedite any remediation efforts, in May 2024, the NC DEQ requested that S&ME prepare a remediation proposal based on the information that S&ME had compiled at that point for all five parks.

In June 2024, S&ME submitted a 10+ million dollar remediation proposal, including 2.1+ million dollars for Northgate Park.

As far as Northgate Park goes, if the evidence from two different engineering firms supported the claim that Northgate Park really was a park where hundreds of tons of potentially hazardous lead infused incinerator cinder from Walltown Park was buried, covered by topsoil, posed a threat, a “clear and present danger” to Durham families, from potentially hazardous elevated levels of lead exposure, then S&ME’s 2.1+ million dollar ambitious remediation proposal for Northgate Park would be prudent and warranted.

However, the evidence doesn’t support that conclusion. That’s why S&ME’s proposed remediation plan for Northgate Park doesn’t appear to be the “good fit” for Northgate Park.

Here’s why:

S&ME proposes remediating 23 subplots at Northgate Park, all colored in maroon on the map they submitted, to indicate lead exposure levels in all maroon shaded subplots >200 mg/kg (ppm.) It’s very dramatic looking. But it’s not completely accurate.

Only ten of those 23 subplots showed elevated lead exposure readings >200 mg/kg (ppm) not 23.

And of those ten subplots, eight of them are in non designated play areas where EPA thresholds of 1200 ppm apply for both normal and superfund sites. And the other two subplots are a mix of dedicated child play areas where an upper threshold of <200 ppm is the norm but the actual readings that indicated slightly elevated lead exposure occurred in the area outside the dedicated child play areas but in the same subplot which means that the EPA upper threshold of >1200 ppm applies to those readings.

Thirteen subplots colored in maroon are actually not sites with elevated exposure >200 ppm. Instead they are subplots where some kind of “waste” was encountered in soil bore tests, but whether that’s from Walltown Park or very likely simply the result of accidental trash from tens of thousands of visitors to the park since it opened almost 85 years ago or the result of incidental trash washed down Ellerbee Creek overflowing on

either side of Northgate Park in the floodplain from neighborhoods north of Northgate Park whose properties front the creek is a fair question;

What's not in dispute is that the "waste" detected in S&ME's soil bore tests for those thirteen subplots did not generate elevated levels of lead exposure by Mid Atlantic XRF surface scans or S&ME's soil bore tests. And since the whole point of remediating any potential subplot is to address any elevated levels of lead exposure, anything that doesn't address that, as noteworthy as removing or covering any found trash in Northgate Park can be, is not the purpose of lead remediation.

For example, in S&ME subplot numbered 825-SB-1, where no elevated levels of lead were detected by Mid Atlantic or S&ME, the "waste" that was detected in soil bore readings is described as "plastic waste." If it was truly "plastic waste" from Walltown park, it's in the wrong location according to the 1955 newspaper article (far to the west of Ellerbee Creek not East) and it's unlikely that any kind of "plastic waste" (if any was actually plentiful then) would have survived 900 degrees of incineration in the early 1950s.

Two of the subplots where slightly elevated lead levels were detected are in the same vicinity where two of the dedicated child play areas are located, where the threshold of <200 ppm applies for those locations in superfund sites.

None of the three dedicated play areas generated elevated levels of lead in their play spaces even though Mid-Atlantic did take a sample from the swing set area from underneath the 12-18 inches of mulch/wood chips in that play space when they didn't find a geofabric liner underneath the mulch. While that reading was >400 ppm, the ground level reading 12-18 inches above that at surface level didn't generate an elevated level of lead, proving that depth of topsoil/cover mitigated and prevented exposure.

The three dedicated play spaces at Northgate Park are intentionally offset from the surrounding park space by virtue of a concrete border in both the older children play space and the swing set area that is approximately 6-7 inches in width and stands about 12-15 inches tall that extends around the entire dedicated play area. There is also a solid 12 inch tall interlinking border around the younger child play area.

These kind of dedicated play spaces with clearly defined fixed borders surrounding them help establish clear boundaries physically between the dedicated child play areas with upper thresholds of lead exposure <200 ppm which remove and reduce risk of exposure by pathways of exposure (ingestion, inhalation, absorption.) Outside those three dedicated child space areas, the upper threshold for lead exposure is <1200 ppm in those non play areas consisting of scrub grass, shrubs, trees, and defined trails. .

That is also why in two subplots where slightly elevated levels of lead were detected outside the play areas, even though they are near them, those areas outside the dedicated play areas that are defined by concrete and stable borders, are considered non play areas where the upper threshold for lead exposure is a far more lenient <1200 ppm.

Unlike traditional school playgrounds where playground equipment and play space seamlessly blend, that's not true at Northgate Park.

The three dedicated playspaces are located in parts of the park where there is tough scrubgrass, trees and shrubs anchored in the brown clayish soil. The best way to navigate those spaces is by the defined paths that run through the park.

That's also why these areas are defined as non play areas where the upper threshold of lead exposure of <1200 ppm applies. They are not like school playground areas. They are part of the park's natural ecological topography instead.

When the lead exposure investigation was ongoing over the past year and orange plastic webbing was in place, those natural ecological areas reverted to their natural wild state of long thick grasses, and when rains and over flooding of Ellerbee Creek occurred, those grasses were flattened and impenetrable. There wasn't a need for fencing. They were naturally hard to traverse unless paths through them were used.

Again, if we were dealing with tons of potentially hazardous lead infused incinerator cinder buried in Northgate Park, S&ME's proposal would seem reasonable to use heavy equipment, grading, bulldozing trees , removing playground equipment, and crushing concrete borders for those defined child play areas or in extreme, just covering them with asphalt.

However, since the likely cause of slightly elevated lead exposure for those few subplots does not appear to originate from some kind of mythical mountain of buried hazardous lead infused cinder waste but instead is likely the result of lead particulates settling in soil from proximity to heavily travelled roads expunged from exhaust from cars over decades, I decided to see if there was another way to remediate lead exposure in child play areas and other areas other than by brute force and bulldozer. So I tracked down the scientist and researcher who first raised the alarm about lead in gasoline in public hearings, which lead to the worldwide ban of lead in gasoline in over 90% of fuels in 1986 and almost the remaining 10% of fuels by 1996, with only a few exceptions.

Dr. Howard Mielke is modest but his science and research are impeccable. And generations of children born since 1986, around the world, have him to thank for not making the world any more polluted with lead particulates from the exhaust of cars burning leaded gasoline.

Cities will still be cleaning up lead in soil for decades going forward but at least it's not worse thanks to Dr. Mielke's tireless efforts to make sure lead in gasoline was removed from use. And thanks to Dr. Mielke's research, we also know practical and economical ways to clean up those sites, too.

I was especially interested in talking to him about Northgate Park after I read a paper he was the lead author on that demonstrated in a 2010 experiment, that there was a fast, economical, cost effective, and successful method for remediating designated child play areas that generated dramatically lower levels of lead exposure right away.

Dr. Mielke confirmed that that this approach not only worked in 2010, but had worked in the decades since then in dozens of other childcare centers with dedicated child play areas. In fact, it could work to remediate almost any site where elevated levels of lead were detected.

In 2010, a simple successful and effective long term "emplacement" or "capping" strategy was tried at multiple child care settings in New Orleans where playground areas were located.

Because of the pre-1978 houses where many of these child care centers and their playgrounds are located (when lead paint was used prior to its discontinuance in 1978) and their proximity to heavily trafficked roads where lead particulates from car exhaust settled on nearby soil in the decades when leaded gasoline was used, child care centers which agreed to be a part of this study, agreed to be a part of this remediation strategy that Dr.Mielke proposed.

Instead of removing contaminated soil, which would have been prohibitively expensive and time consuming, this long term "emplacement" or "capping" strategy was implemented.

Dr. Mielke and the other researchers of the 2010 experiment write:

"The soil emplacement was conducted by first spreading out a bright orange, water pervious geotextile material to cover the original soil of the play area. The geotextile layer prevents Pb-safe soil from mixing with the underlying original soil and acts as a warning layer to anyone digging into soil. Soil was not removed from the play areas in this project.

"The Pb-safe <lead safe> soil was from the Bonnet Carré Spillway, located up-river from New Orleans (U.S. ACE or Army Corps of Engineers). The alluvial soil, derived from thesediments of the Mississippi River at the Bonnet Carré Spillway, has a median Pb <lead> content of 5mg/kg <5 ppm> (Mielke et al., 2000). The Bonnet Carré soil was transported to the childcare center and emplaced on top of the geotextile layer to a depth of at least 15 cm (6 inches).
[…]

Before emplacement of Pb-safe <lead safe> soil, the median soil Pb <lead> for all of the play areas was 558 mg/kg (ppm). After emplacement of Bonnet Carré Spillway soil, the median Pb <lead reading> was 4.1 mg/kg (ppm), or a decrease in median soil Pb <lead> by a factor of 135.

[…]

"This project indicates that within hours, at a cost of about U.S. $100 (2010) per child, exterior play areas at childcare centers can be transformed from Pb contaminated <lead contaminated> to Pb-safe <lead-safe> with a margin of safety. This is a miniscule cost when compared to the costs associated with secondary prevention and treatment of Pb <lead> poisoned children, costs of learning and behavioral disorders, and subsequent costs to society of lifelong chronic health problems"

Mielke, H.W., et al., "Soil intervention as a strategy for lead exposure prevention: The New Orleans lead-safe childcare playground project", Environmental Pollution Journal (2010)

To read the entire research paper, go to this link: https://www.leadfreefrisco.com/wp-content/uploads/2011/03/2011-online-Soil-intervention-lead-safe-childcare-project.pdf

The approach was a simple one. When elevated levels of lead were detected by XRF surface scans, for example in children's play areas, the goal was to "encapsulate" or "cap" an identified area where elevated lead levels were detected with a layer of geofabric over the area (orange is a good color to make sure people don't try to excavate past it) and then add a barrier of fresh dirt/mulch product on top of the geofabric to separate the area where elevated lead levels were detected.

With the kind of pristine soil that Dr. Mielke had available, he found he could immediately remediate an area with just 6 inches of that soil because the lead levels were so low. In other locations, like Northgate Park, having a barrier of 12-18 inches of mulch/wood chips (that already tested low in lead exposure) in those dedicated play spaces with concrete and fixed boundaries helped prevent exposure .

Geofabric allows drainage but blocks plant roots from gaining traction in the contaminated soil beneath it. When additional soil/mulch is placed on top of the geofabric, that added depth of topsoil/mulch/wood chips helps mitigate risk of lead exposure. Geofabric plus depth of clean soil/mulch/wood chips helps prevent lead exposure.

Dr. Mielke said it's an elegant solution to immediately offset potential lead exposure that's economical, fast, effective, and can be implemented in a matter of hours.

The only consideration to be aware of is that this kind of remediation needs to be periodically monitored and refreshed with fresh mulch/woodchips/soil to ensure continued "encapsulation" to prevent exposure to the contaminated soil below, much like public works already do with regular replenishment of mulching/wood chips on

public playgrounds in Durham and surrounding counties and playgrounds throughout the country.

It was refreshing and reassuring to know that to know that there's a practical, proven and cost effective approach to help remediate sites, as Dr. Mielke demonstrated.

The fact that the three designated play areas with clear boundaries and borders at Northgate Park had already demonstrated those principles long before the lead exposure investigation commenced with clearly defined rigid buffers and boundaries between dedicated child spaces and non play park areas, with geofabric and mulch/woodchips or simply depth of that by itself is testimony to Durham's foresight in planning and implementing these dedicated playground spaces at Northgate Park.

The lead abatement strategy that Dr. Mielke pioneered in 2010 and which was already in place at Northgate Park in the three designated play areas is a great confirmation of its effectiveness. Why that mulch/wood chip barrier in those designated play areas was removed in September 2024 without public oversight, comment or explanation and replaced with crushed stone remains to be explained.

When I looked at the data more closely that both Mid-Atlantic and S&ME compiled, it appears that any slightly elevated lead exposure readings that Mid-Atlantic reported came from outside the designated child play areas that had concrete defined borders with 12-18 inches of mulch/wood chips throughout the dedicated play spaces.

More importantly, no elevated levels of lead appear to have been actually detected in any of three dedicated play areas at the surface level in the actual play areas. The slightly elevated readings in two of the three areas appear to be from outside those designated play areas where kids play. That's confirmation that depth of mulch/wood chips works to mitigate and remove risk of exposure and the concrete rigid boundaries and borders that defined those spaces also help to contain 12-18 inches of mulch throughout those play spaces (before they were intentionally removed in September 2024 and replaced with crushed stone.)

When Mid Atlantic investigated the dedicated play areas (when mulch/woodchips were still present,) Mid Atlantic reported encountering 12-18 inches of mulch and liners underneath two of the three play areas (the older children play area and the younger child play area) but while there was 12-18 inches of mulch/wood chips in the swing set area, there was no geofabric liner underneath that.

Underneath that mulch/woodchip area in the swing set area near the parking lot and nearby road is where Mid-Atlantic took a soil reading. Not surprisingly, given the location and proximity to automobiles and the use of leaded gasoline for so many decades preceding it, Mid-Atlantic reported elevated levels of lead exposure from that soil sample >400ppm 12 inches underneath the mulch/wood chips. But those elevated

levels weren't evident at ground level on top of the 12-18 inches of mulch indicating that depth of barrier worked to mitigate and remove risk.

Dr. Mielke observed that even without a geofabric liner, that much mulch would be protective and remove threat of exposure in a defined area like the ones that Northgate Park already had in place for those three designated play areas (until they were removed in September 2024.)

In retrospect, it seems clear and should give parents relief to know that the three dedicated play areas at Northgate Park did not have elevated levels of lead exposure to begin with. However, to be fair, when reports arose in 2022 of the 1955 news article alleging that 500 truckload of cinder from Walltown Park had been dumped at Northgate Park raising the specter of possible lead exposure, it's understandable why officials felt they had no choice but to close and fence off Northgate Park's three dedicated playground areas for the better part of the past year out of abundance of caution until investigations could occur.

After comprehensive multi-year testing by two of North Carolina's leading engineering firms, it is now clear that Northgate Park does not contain the tons of potentially hazardous, lead-infused incinerator cinder previously alleged to be buried beneath its native soils.

Given that the few slightly elevated lead readings recorded were found in non-play areas, where EPA-approved lead exposure thresholds of <1200 ppm are acceptable, and are most likely due to historical car exhaust emissions from when leaded gasoline was prevalent, there is no reasonable basis to proceed with costly remediation efforts that would weaken the Ellerbee Creek floodplain through Northgate Park as well.

The 1955 news article made a serious allegation that "500 truckloads" of cinder (constituting literally tons of waste) from Walltown Park were allegedly dumped and buried at Northgate Park. Until that allegation was investigated, given the hazard of potential lead exposure, it made sense to include Northgate Park in the "Pre Regulatory Landfill Site" program. However that is no longer appropriate. It's time for Northgate Park to be removed from that program.

North Carolina citizens can be proud that such a thorough investigation was done at Northgate Park. Now that the evidence from those investigations demonstrate that there are no tons of potentially hazardous lead infused cinder buried at Northgate Park under its native soils, the children and families who have used Northgate Park for recreation have a right to expect the orange plastic fencing to come down, regular park maintenance to resume and the park's three dedicated child play areas are made right again and opened up as soon as possible so that families and children can use them again.

As Northgate Park approaches its 85th anniversary in 2025, a milestone of serving Durham's diverse and inclusive communities, the reopening of the entire park, its dedicated play areas, and resumption of much-needed maintenance of its grounds and trails are all reasons to celebrate. This will allow children and families to once again enjoy this beloved space, as they should have been able to all along. The long-delayed upkeep that the park so desperately needs will finally be addressed, bringing back the beauty and accessibility of Northgate Park.

It's time for Northgate Park to be a source of pride once again. It’s time to let Northgate Park resume its role as one of Durham’s treasured parks. It’s the right thing to do, and the right time to do it.

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*About the author: Scott Washington is no stranger to Durham or Northgate Park. He and his grown kids have fond memories of coming to Northgate Park when it had vintage playground equipment, including the fabled “Rocket Ship Slide.” In addition to being a renowned Historian whose popular show, “History Matters,” on award winning WCHL radio in Chapel Hill is now the nation’s longest running live weekly segment on history on commercial radio, Washington worked with Eastman Kodak for over a dozen years in technical support and on numerous special projects, garnering awards and recognition. As part of his Kodak work, Scott also received OSHA training in hazardous waste, PPE, and lead safety.