

Briefing Notes for Testimony before South Carolina Senate Committee regarding The Pinewood Site

Wednesday, May 27, 2015
Columbia, South Carolina

by **William A. Stephens, P.E.**
Co-founder and Managing Principal

Kestrel Horizons, LLC
(Trustee of Pinewood Site Custodial Trust)
December 24, 2003 through October 31, 2014
and
Sparrow Hawk, LLC

Pinewood Site Briefing Notes and Document Package Content

- Site Orientation and History
- Underlying Myths and Misrepresentations
vs Facts and Truth
- Facility Fundamentals: Hazardous Waste, Leachate,
Landfill Design and Operations, Conceptual Site Model,
Infrastructure Conditions and Environmental Protection
- Laws, Regulations, and Government Involvement
- Costs and Savings
- Choices, Consequences, and Benefits



SPARROW HAWK

Pinewood Site Briefing: The Seven Key Points

- **Number 1:** The Conceptual Site Model ratified by DHEC permits and tenaciously maintained by facility owners and DHEC management for 35 years was always wrong.
 - Landfills containing organic wastes leak liquids and gasses from the bottom, sides, and cover – and especially the single-lined cells of this one.
 - The foundational principles, “leaks only go out the bottom” and the “underlying Opaline claystone and inflow from groundwater beneath the Opaline claystone layer prevent groundwater pollution” are fatal fallacies of the historical CSM.



SPARROW HAWK

Pinewood Site Briefing: The Seven Key Points

- **Number 2:** Commercial hazardous waste landfill leachate and gasses are not the same as those from municipal solid waste or industrial waste.
 - Commercial hazardous waste landfill leachate and gasses can be much stronger and have much higher “pollution potential.”
 - The Pinewood landfill leachate varies greatly in composition - as do gasses - which means management methods must be tailored to fit and change through time.



SPARROW HAWK

Pinewood Site Briefing: The Seven Key Points

- **Number 3:** By state and federal law, environmental permitting must address known and potential releases of hazardous waste, hazardous waste constituents, and priority pollutants based on quantitative risk assessment.
 - Hazardous waste constituents exist outside of containment around and over single lined landfill cells of Section I (IA thru IE) and Section II (IIA and IIB).
 - The RCRA Corrective Action Plan for the site does not address these, nor did DHEC wish to incorporate these in the RCRA Part B Permit Application or the NPDES Permit Application, as of October 2014.



SPARROW HAWK

Pinewood Site Briefing: The Seven Key Points

- **Number 4:** The environmental monitoring system is not capable of detecting a release of hazardous substances that threatens Lake Marion and the Sparkleberry Swamp until it is too late to prevent.
 - Monitoring of the water table aquifer and Opaline claystone layer using monitoring wells is nearly useless.
 - The French drain system exists adjacent to only 43% of Section I and none of Section II single lined cells. Where it does exist it discharges uncontrolled to Lake Marion. The historical CSM infers the French drain exists everywhere.



SPARROW HAWK

Pinewood Site Briefing: The Seven Key Points

- **Number 4:** The environmental monitoring system is not capable of detecting a release of hazardous substances that threatens Lake Marion and the Sparkleberry Swamp until it is too late to prevent.
 - Gasses condense underground to contaminate shallow groundwater in any direction.
 - Water above containment in the cover system of Section I contains hazardous substances in concentrations up to 100X the drinking water standard; this water becomes either contaminated groundwater or contaminated surface water when it runs off the cover system.



SPARROW HAWK

Pinewood Site Briefing: The Seven Key Points

- **Number 5:** The nature of wastes disposed, design of the containment, and operating conditions within the single-lined cells of Section I (and possibly Cells IIA and IIB) strongly indicate waste containment is failing or has failed.
 - Leachate removal rates in some sumps are very low, yet leachate pours in the joints of the sump risers nearly all the way to the surface.
 - The rubberized 30 mil Hypalon® liner with glued 1 ½ inch seams was never designed to withstand the constituents nor the concentrations of the waste. Neither was the 20 mil PVC cover or the seams.



SPARROW HAWK

Pinewood Site Briefing: The Seven Key Points

- **Number 5:** The nature of wastes disposed, design of the containment, and operating conditions within the single-lined cells of Section I (and possibly Cells IIA and IIB) strongly indicate waste containment is failing or has failed, creating the conditions for major releases.
 - The clay liner and Opaline claystone desiccates and cracks when exposed to organic chemicals of high enough concentrations; this creates preferential pathways – “express lanes” – for contaminant transport .
 - Leachate composition varies greatly, so no one knows where these conditions may exist around and beneath the landfill. We do know these conditions create catastrophic failure of landfill containment systems.



SPARROW HAWK

Pinewood Site Briefing: The Seven Key Points

- **Number 6:** Prevention of the contamination of Lake Marion and the Sparkleberry Swamp can be accomplished by relatively simple means within the funds available in the Permitted Sites Fund, which is now in excess of \$22 million.
 - Waiting to remediate a major release would dramatically increase costs and natural resource damage will be virtually irreversible.
 - To employ a “just-in-time” approach would constitute gross negligence and willful malfeasance – as well as violation of federal and state laws. Just-in-time will not be in time. Guaranteed fail.



SPARROW HAWK

Pinewood Site Briefing: The Seven Key Points

- **Number 7:** Cost management, liability management, and environmental stewardship go hand-in-hand-in-hand for the Pinewood Site. These are not mutually exclusive objectives.
 - Prevention costs less, reduces liability exposures for taxpayers, and protects human health and our environment.
 - At the core, these are not partisan or political issues; these are fundamental ethical, fiduciary, and legal issues. All stakeholder parties, except former owners and operators, desire and expect fundamentally the same things.



SPARROW HAWK

Pinewood Site Briefing: The Seven Key Points

- **Number 7:** Cost management, liability management, and environmental stewardship go hand-in-hand-in-hand for the Pinewood Site. These are not mutually exclusive objectives.
 - The federal CERCLA (aka "Superfund") law requires that the responsible parties in control of a site at a particular time obey applicable laws and regulations and take reasonable and appropriate actions to mitigate risks and costs on behalf of other potentially responsible parties.
 - Concealing or camouflaging pertinent information can adversely affect the ability of the responsible party, e.g., "Operator", to recover costs from PRP's and/or legally induce PRP's to participate or contribute to costs. Once done, this legal transgression is very difficult to "undo".



SPARROW HAWK

The Pinewood Site

Regarding the DHEC/ Haley and Aldrich

Report of April 17, 2015

- 1. The report, while clearly well crafted with the assistance of several DHEC attorneys and managers, does not consider the wealth of information available.**
 - For example, none of the information contained in the July 18 RCRA Part B Post Closure Permit Application, or the July 25, September 18, or September 25, 2014 document packages prepared by Kestrel Horizons, LLC, as Trustee, were apparently provided to Haley and Aldrich. None were included in the list of documents reviewed.



SPARROW HAWK

The Pinewood Site

Regarding the DHEC/ Haley and Aldrich

Report of April 17, 2015

- 2. The Haley and Aldrich report appears to lack the substantial involvement of professional engineers participating in an inter-disciplinary team.**
 - That's the same critical mistake characteristic of 2002 - 2014 AECOM reports - and Environ reports from the late 1980's and early 1990's - that created and maintained the fatally flawed Conceptual Site Model. Virtually none of the reports formulating and analyzing the CSM were signed by professional engineers. All were signed by professional geologists ONLY. Landfills are man-made, not nature-made. Inter-disciplinary analysis is essential.
 - Repeating a set of suppositions often does not create a set of facts. Models must be based on facts.



SPARROW HAWK

The Pinewood Site

Regarding the DHEC/ Haley and Aldrich Report of April 17, 2015

- 3. My impression is that DHEC managers gave the Haley and Aldrich firm their watch and asked the firm to tell them what time it was. The answer was, "April 17, Nineteen Eighty Something."**
- 4. A waste of taxpayers' and citizens' money and time. A diversion. A sham. A whitewash. No offense intended to the Haley and Aldrich firm, which I hold in high regard.**



SPARROW HAWK

The Pinewood Site

Regarding the DHEC/ Haley and Aldrich Report of April 17, 2015

- 5. Lawyers and politicians need to step away and let technical experts and managers do their jobs without influence, intimidation, or recrimination.**



SPARROW HAWK

The Pinewood Site Recommendations

- 1. Remove the responsibility for management of the Pinewood Site from DHEC. The agency has too much baggage accumulated over 35 years to haul around. DHEC is a regulatory agency – not a management entity.**



SPARROW HAWK

The Pinewood Site Recommendations

- 2. Create a Task Group consisting of representatives of Santee Cooper and the SC Department of Natural Resources, County Administrators, and at least two citizen members selected by Santee Cooper and the DNR.**
 - Chair to be elected by the members.
 - Operating rules to be established by the Task Group.
 - Reporting to the Director of the SC DNR.
 - Coercion and unethical and illegal acts by elected officials and government employees to be subject to state and federal tort laws and civil action, and criminal prosecution.



SPARROW HAWK

The Pinewood Site Recommendations

3. Clean house at DHEC.



SPARROW HAWK

The Pinewood Site Recommendations

4. Involve South Carolina's best and brightest – including but not limited to professors and students from the University of South Carolina and Clemson University. This is a world class problem. Apply world class talent.

- Establish an initial grant of \$300,000 minimum to be distributed and managed by the Pinewood Site Task Group. Use the Permitted Sites Fund (~ \$22 mil balance) or the Pinewood Site Environmental Impairment Trust Fund (~ \$5 mil balance). The conditions at the site have already triggered the terms of use of either or both funds.
- 85% of the Permitted Sites Fund came from generators who brought waste to the Pinewood Site.



SPARROW HAWK

The Pinewood Site Recommendations

5. Pursue governmental potentially responsible parties (PRP's) for voluntary cost contribution and settlement.

- The "joint and several" liability provisions of CERCLA mean that any individual PRP can be held wholly liable for any and all remedial and/or removal actions at the Pinewood Site affected by their materials containing hazardous substances.
- DOD, the US EPA, several state agencies similar to SC DHEC, and many other government entities contributed a substantial portion of the 4 million cubic yards of waste to the site (1 million cubic yards to Section I).



SPARROW HAWK

The Pinewood Site Recommendations

6. Initiate sound environmental monitoring and preventative action measures immediately.

- Design and install vertical barriers to intercept shallow releases. These will be 20 to 45 feet deep and extend into the Opaline claystone layer.
- Design and install French drains around all single-lined cells similar to the ones that exist around 43% of Section I. Integrate these with the barrier designs and environmental monitoring system designs.
- Design and install means to control and route liquid collected in French drains and elsewhere, including segregation and mixing.



SPARROW HAWK

The Pinewood Site Recommendations

6. **Initiate sound environmental monitoring and preventative action measures immediately.**

- Design and install cover system supplements for section I, tying into and extending beyond new vertical barrier system, and existing and new French drains.
- Design and install additions to leachate extraction systems in single-lined cells – especially those of section I.
- Design and install means to extract and route liquid between the existing and new cover and liner/barrier systems, including segregation and mixing.



SPARROW HAWK

The Pinewood Site Recommendations

6. **Initiate sound environmental monitoring and preventative action measures immediately.**

- Design and install leachate and liquid treatment capability and capacity in the large (oversized by design) Leachate Treatment and Containment Building, with appropriate unit processes and piping to select the right treatment process combinations for the leachate or other liquids to be treated.
- Many treatability studies have been done; more are needed. Proven expertise and inter-disciplinary teamwork is absolutely critical. This is **very** challenging and some large firms have fallen short of basic competence needs, let alone excellence.



SPARROW HAWK

The Pinewood Site Recommendations

- 7. Identify, evaluate, and pursue cost and liability management initiatives and measures – including the unconventional and innovative – immediately.**
- Design and implement on-site leachate, contaminated liquid, and solids treatment improvements and additions to facilitate on-site and off-site disposal, recycling, controlled discharge or emission.



SPARROW HAWK

The Pinewood Site Recommendations

- 7. Identify, evaluate, and pursue cost and liability management initiatives and measures – including the unconventional and innovative – immediately.**
- Design and implement on-site disposal of leachate solids and/or problem wastes in a Post-Closure Landfill Cell constructed within the double-lined Closure Cell (Cell IIIC), constructed by the PSCT in 2005 and 2005. This cell contains 750,000 cubic yards of soil – most of it clean.
 - This can be accomplished simply and in stages, creating 200 to 300 years of on-site secure capacity within the Closure Cell, and eliminating CERCLA liability for off-site disposal of Pinewood Site wastes.



SPARROW HAWK

The Pinewood Site Recommendations

7. Identify, evaluate, and pursue cost and liability management initiatives and measures – including the unconventional and innovative – immediately.

- Design and implement storm water management system improvements to minimize infiltration of storm water into secondary liner systems.
- Identify, design, and implement means to optimize operations, balancing labor, materials, equipment, energy consumption, security, and system reliability elements.



SPARROW HAWK

The Pinewood Site Recommendations

7. Identify, evaluate, and pursue cost and liability management initiatives and measures – including the unconventional and innovative – immediately.

- Convert to electronic inspections, recordkeeping, and reporting – whether or not DHEC and US EPA are ready for the 21st century.
- Roll-out and implement web-based Operations and Information Management System designed by Kestrel Horizons to integrate and link the work of dozens of contractors and consultants, as well as a wealth of historical documents.



SPARROW HAWK

The Pinewood Site Recommendations

By the way:

There is really nothing new here. We are simply summarizing a portion of the work of Kestrel Horizons, LLC as Trustee of the Pinewood Site Custodial Trust and the Trust's 60+ contractors, consultants, and suppliers from December 24, 2003 through October 31, 2014.

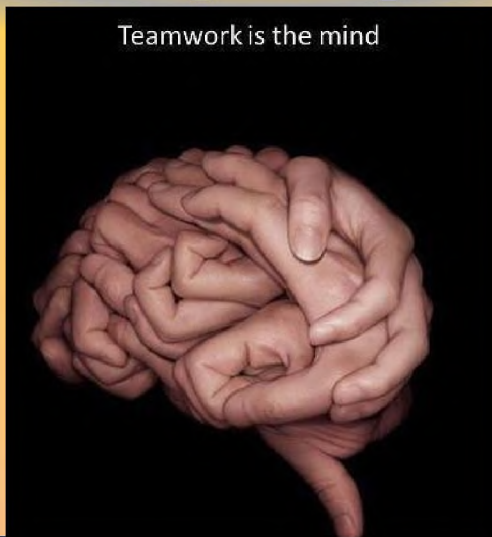
Who would have guessed that?



SPARROW HAWK

The Pinewood Site Closing Thoughts

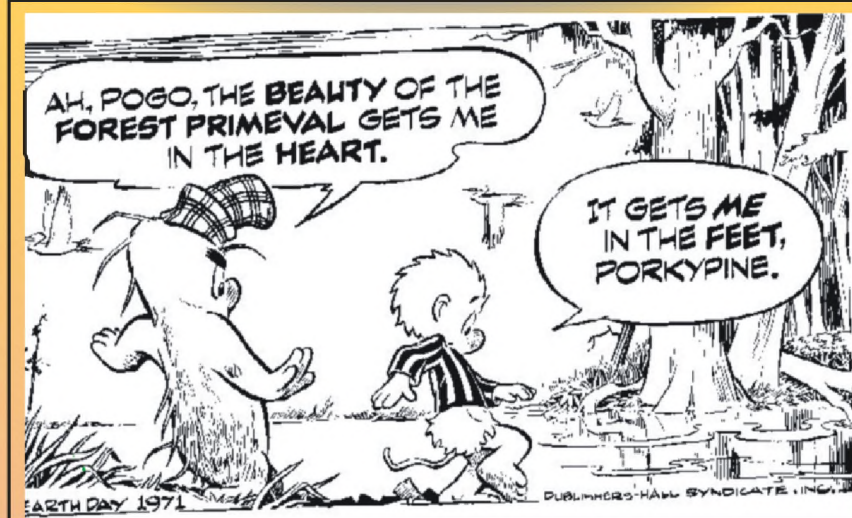
Teamwork is the mind



SPARROW HAWK

The Pinewood Site

Passing Thoughts



SPARROW HAWK

The Pinewood Site

Passing Thoughts



SPARROW HAWK

The Pinewood Site

Passing Thoughts

"A half-truth is the most cowardly of lies."

–Mark Twain



SPARROW HAWK

The Pinewood Site

Passing Thoughts

"Always do right. This will gratify some people and astonish the rest."

–Mark Twain



SPARROW HAWK

The Pinewood Site Passing Thoughts



*They're lighting
their arrows!
Can they do
that?*

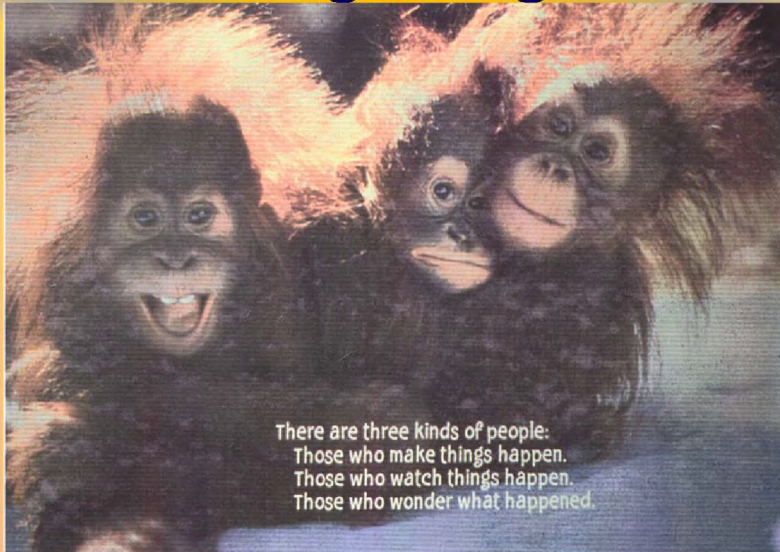
Gary Larson

@FarWorks



SPARROW HAWK

The Pinewood Site Passing Thoughts



There are three kinds of people:
Those who make things happen.
Those who watch things happen.
Those who wonder what happened.



SPARROW HAWK

PEW Pinewood Exposition and Workshop Agenda

- **Brief Orientation and History**
- **Underlying Myths and Misrepresentations vs Facts and Truth**
- **Fundamentals of Landfills, Leachate, Hazardous Waste, and Environmental Protection**
- **Laws, Regulations, and Government Involvement**
- **Costs and Savings**
- **Choices, Consequences, and Benefits**



SPARROW HAWK

PEW The Pinewood Site

Brief Orientation and History

**See Exposition and Workshop Presentation.
The following are useful aerial photographs.**



SPARROW HAWK

PEW

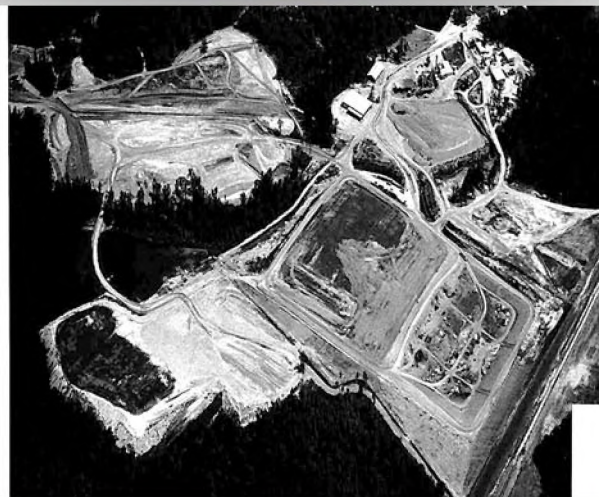
The Pinewood Site

Brief Orientation and History

**SPARROW HAWK****PEW**

The Pinewood Site

Brief Orientation and History

**SPARROW HAWK**

PEW

The Pinewood Site

Brief Orientation and History

**SPARROW HAWK****PEW**

The Pinewood Site

Brief Orientation and History

**SPARROW HAWK**

PEW

The Pinewood Site

Brief Orientation and History



SPARROW HAWK

PEW

The Pinewood Site

Brief Orientation and History



SPARROW HAWK

PEW

The Pinewood Site

Brief Orientation and History

**SPARROW HAWK****PEW**

The Pinewood Site

Brief Orientation and History

DATE: JULY 6, 2004

**SPARROW HAWK**

PEW

The Pinewood Site

Brief Orientation and History

**SPARROW HAWK****PEW**

The Pinewood Site


Brief Orientation and History

**SPARROW HAWK**

PEW

The Pinewood Site

Brief Orientation and History



APRIL 18, 2011


©2010 Google


 **SPARROW HAWK**

PEW


The Pinewood Site


Brief Orientation and History



 **SPARROW HAWK**

PEW **The Pinewood Site**
Brief Orientation and History



 **SPARROW HAWK**

PEW **The Pinewood Site**
Brief Orientation and History



 **SPARROW HAWK**