Resume´ and Experience Highlights
William A. Stephens, P.E.

May 2016

My name is Bill Stephens. I am a registered Professional Engineer in South Carolina and several other states, and graduated in 1973 from the University of Wisconsin with a BS in Civil and Environmental Engineering.

These pieces provide an increasing level of detail regarding my experience and qualifications.

I have been very fortunate to have had opportunities and mentors that enabled an uncommon range and depth of experience as well as development of solid technical, management, and interpersonal skills.

My strengths include:

- conceptual civil, environmental, and systems engineering
- strategic analysis and master planning
- procurement and contracting
- construction management
- team leadership and management
- project management
- client and project development
- strategic offering development
- proposals, presentations, and closing
- negotiations and conflict management
- “lifeboat” situations
- business results management

Engineering, construction, enterprise, and teamwork have always been my primary interests. Those interests and foundation skills were the primary factors that enabled me to help teams and clients tackle big challenges and achieve extraordinary results for the firm and for our clients. Communication and collaboration come naturally for me – as does bringing out the best in people.

I have been very fortunate to have had opportunities and mentors that enabled an uncommon range and depth of experience as well as development of solid technical, management, and interpersonal skills. In some cases those opportunities came because I was "one of the tallest ants on the basketball court" in the new and exploding field of hazardous waste and Superfund sites. To give you some idea of my professional background, my wife and I sat next to GM Chairman and CEO Roger Smith and his wife at dinner and for ceremonies as special guests at an event in 1985.

What follows describes some highlights of the 16½ years of Kestrel Horizons, LLC, which I co-founded in 1998 and closed at the end of 2014 to found its successor, the Sparrow Hawk Group. Highlights of engineering, project management, and construction management work at RMT, Inc., TKDA, the City of Madison Wisconsin, and D'Onofrio, Kottke and Associates are also included.

At Kestrel Horizons/Kestrel Management Services:

- Co-founded the environmental engineering, management, and science consulting firm in 1998.
- Led the development and operation of the firm's service to industry and legal counsel in 15 states
  - power (coal, gas, nuclear fuel, waste-to-energy), chemical, foundry and secondary smelting, mining and minerals processing, aerospace, marine port and ship restoration, legacy sites.
- Led Kestrel in these specific areas:
  - project management, construction and remediation management, contracting, negotiations, performance-based compensation, management systems, cost estimating and options analyses, public communications and interface, risk management, constructive use of secondary materials.
- Conceived and led the Good to Great programs, including Marketing and Client Development, Project Management, Technical Excellence, Interpersonal Skills Development, and Career Development, resulting in substantial growth and substantial improvements in all five areas as well as overall business performance.
- Led the Trustee services to the Pinewood Site Custodial Trust from April 2003 through October 2014.
  - Can rightly claim having "the eye of the owner" for more than a decade, which is a major element of credibility with industrial clients, regardless of the sector.
  - Managed $65 million in public trust funds over eleven years, closing, operating, maintaining, and implementing major improvements at a 535-acre bankrupt commercial hazardous waste facility that was once the second largest in the US.
  - Managed the Trust Team of Kestrel Horizons, LLC as Trustee – three to ten staff, depending on project intensity.
  - Responsible for all procurement, contracting, performance management, change management, accounting, and payment of all vendors to the Trust, including contractors, consultants, suppliers, attorneys, accountants, and auditors.
  - The team procured, contracted, and managed more than 60 contractors, consultants, and suppliers to perform engineering, construction, remediation, scientific, O&M, T&D, and monitoring work.
  - The team saved more than $10 million through innovative concepts and management methods, which was roughly equivalent to a full offset of all professional fees and trustee expenses.

- Hired and managed attorneys, accountants, auditors, investment firm, and bank. Issued all payments and held all permits, as Trustee.
- Responsible for compliance with environmental, health, safety, and security compliance, permitting, and activities;
- Developed the web-based Operations Management System for the facility, organizing and linking more than one million pages of documents in a digital system with intuitive navigation and communication with real-time distributed control system information for leachate pumping, storage, and treatment as well as mechanical and electrical systems.
- Led communications and negotiations with regulatory agencies, as Managing Principal of Kestrel Horizons, LLC in its permit holder role as Trustee.

At RMT, Inc. (now part of TRC), I was Employee Number 12 in January 1979, and played various leadership roles in growing that firm to 850 people with 25 offices by 1992. The pieces that follow describe some of the highlights of those roles from 1979 to 1998, when I co-founded Kestrel Horizons with three other original senior people from RMT, including RMT's founder and immediate Past President.

At the City of Madison, Wisconsin I served as Project Engineer under two Senior Project Engineers, leading and coordinating engineering and landscape architecture design and all public utility work for an urban renovation project involving rights-of way for 20 city blocks at the center of downtown Madison, Wisconsin. I prepared the technical specifications and all other bid documents, and led the procurement, contracting, and construction management of the project in the field. The total budget was $6.2 million in 1977. Crew totals for GC's, specialty contractors, and utility crews and managers topped out at just under 300 in 1977. I managed the field crew of construction surveyors, inspectors, and field engineers – which totaled from five to twelve, depending on needs.

I got the lead role because the City Engineer believed the project was doomed to failure and the role would be a good learning experience for me – for as long as it lasted. It was. I worked 55 to 75 hours per week (spring 1976 through fall 1978) through design, procurement, and construction, determined the project would succeed and become a reality. It did. And the project was a catalyst for the revival of downtown Madison.

At TKDA in St. Paul, Minnesota, I performed quantity and cost estimating for all site work on the 50 acre project, including earthwork, storm and sanitary sewer piping, service water piping, paving, and concrete structures for utilities and access. Estimate of approximately $6.15 million prepared within six work days with a scale, two triangles, two red pencils, and computation pad was within 1.5% of the estimate prepared over six weeks by two engineers and one technician using a main-frame computer.

At D'Onofrio, Kottke and Associates in Madison, Wisconsin, I performed land surveying, construction control surveying, topographic surveying, second order control surveying, construction staking, construction inspection of roads and sewer systems, survey note reduction and plotting, topographic mapping, engineering plan and survey plat drafting, and quantity

takeoffs and cost estimating for this public works/land development engineering firm. Three excellent mentor/teachers.

The following is a very brief summary of employment history:

Employment History

Sparrow Hawk Engineering, LLC
Travelers Rest, South Carolina 10/14 - Present
Founder, Managing Principal

Kestrel Management Services, LLC / Kestrel Horizons, LLC
Greenville, South Carolina 4/98-10/14
Co-Founder, Managing Principal

RMT, Inc.
Greenville, South Carolina (Southeast Region) 7/88 – 3/98
Positions:

- **Vice President,** 7/86 – 3/98
- **Corporate Task Force Leader and Regional Director of Project Management,** 7/88 – 12/90
- **Corporate Task Force Leader, Remediation and Construction Management,** 1/91 – 12/94 (1993 & 1994 – **Corporate**)
- **Corporate Program Manager, Chemicals, Plastics, and Pharmaceuticals Industries,** 8/95 – 12/97
- **Corporate Program Manager, Metals Treatment Technologies,** 3/93 – 9/95
- **Senior Consultant and Project Director: RCRA, CERCLA, and Environmental Management Systems,** 1988 – 3/98
- **Regional Program Manager, Metals and Automotive Industries, Commercial Waste Industries,** 1/91 – 6/95
- **Regional Director of Client Services,** 1991
- **Regional Program Manager, Solid Waste Management Services,** 7/88 – 12/90

RMT, Inc.
Madison, Wisconsin (Northern Region) 1/79 – 6/88
Positions:

- **Manager of Engineering,** 6/80 – 7/86
- **Project Manager,** 1/79 – 6/88
- **Vice President and Director of Project Development,** 7/86 – 6/88
- **Senior Consultant, RCRA, CERCLA, and Environmental Master Planning,** 1980 - 1988
- **Manager of Technical Services,** 1/79 – 6/80

City of Madison – Engineering Division

Madison, Wisconsin
Position: **Civil Engineer,** 5/74 – 1/79

Toltz, King, Duvall, Anderson, Inc.
Consulting Engineers and Architects
St. Paul, Minnesota
Position: **Civil Engineer-in-Training,** 1/74 – 5/74

D'Onofrio, Kottke and Associates
Consulting Engineers and Surveyors
Madison, Wisconsin
Position: **Engineering Technician,** 6/70 – 12/73 (Summer and Part-time work)

EDUCATION

B.S. in Civil and Environmental Engineering, University of Wisconsin, Madison – 12/73. Graduated *cum laude*.

REGISTERED PROFESSIONAL ENGINEER: South Carolina, North Carolina, Georgia, West Virginia, Wisconsin

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Here is a list of what others – clients, mentors, enterprise managers, colleagues, and team members – have identified as my strengths:

Technical and Client Service Foundational Understanding

- Conceptual engineering, alternatives analysis and cost estimates – civil and environmental;
- Topography and grading design;
- Forensic engineering and science;
- Working with people in other disciplines – structural, mechanical, electrical, and specialty engineers as well as landscape architects, architects, scientists, planners, contractors, purchasing, management
- Conceiving graphic representations of complex ideas and processes – 3D visualizations, flow diagrams, corollary illustrations – I see 2D in 3D;

Project, Procurement, and Construction Management

- Project management – art and science;
- Construction management;
- Contract development, negotiation, and performance management;
- Contractor and consultant performance management;
- Managing change with clients – including securing compensation
- Fostering interdisciplinary collaboration and coordination;
- Managing hard-to-manage people;

Organizational and People Development

- Service program development;
- Organizational forensics;
- Conflict resolution, polarity management, and negotiations;
- Teaching, mentoring, and growing people;
- Management system and tool development;

Marketing, Sales, and Client Service Management

- Interviewing clients to identify needs, budget, expectations, decision-makers, competition, pre-conceived notions, and pathways and obstacles to closing;
- Writing and composing proposals and marketing literature;
- Creating and delivering presentations and talks;
- Closing sales;
- Representing and organization in a professional and personal way;
- Representing a client within a professional service organization;
- Client relationship development and service management;
- Target market management;
- Extemporaneous speaking and writing;
- Writing articles and papers;

Business Planning, Management, and Leadership

- Business planning- strategic and operational;
- Issues management;
- Strong leadership in “lifeboat situations” – leading to accomplish extraordinary results against the odds;
- Making difficult decisions in real time, while respecting principle and pragmatic perspectives;
- Technology program development;
- Acquisition integration;

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General Statement of Qualifications

The process of gaining an understanding of needs, working as part of a team to craft and present proposed solutions and work, establishing contracts and arrangements for the work, and delivering extraordinary results that surpass expectations have been central to my entire professional career.

As an engineer, a project manager, a client service manager, a target market program director, a director of project management, an executive manager, a consulting firm owner, an agent, a contractor, a client, and a teacher and mentor, I have experienced the process from all angles – and have produced solid results from all angles.

At RMT, for 20 years, and at Kestrel Horizons, for 16 years, client development, market development, prospecting, scoping, selling, closing, contracts, and client satisfaction, and business performance results have been an integral part of everyone's job.

Training, expectations, and performance metrics and rewards contributed to strong business results, high client retention and repeat business, enthusiastic new clients, solid referrals, sole-source work, and higher multipliers – even for the relative-commodity portions of the work.

I bring solid experience in EPC and EPCM practices, responsibilities, and contracts; interdisciplinary coordination and integrated design; and strong analytical skills, alternative and strategic thinking, and advocacy and support judgment. Since 1979, I have used these two adages with teammates:

> **You can't win them all unless you win the first one.**
>
> **You can't win them all unless you win each one.**

I am a creative person who blends conventional systems and tools with unique perspectives and approaches. For the most part, that is refreshing to clients and teammates – and has been the secret to winning and succeeding against the odds and delighting clients, teammates, stakeholders, and shareholders.

I am a lifelong learner and teacher, teammate and leader, and engineer and manager with fire in the belly and an instinctive drive to contribute and produce extraordinary results and outcomes.

Key Performance Elements for Contracts and Proposal Managers*

Situations and Opportunities: support of client development and opportunity prospecting, opportunity and sales pipeline management, analytical support of initial client targeting and opportunity selection, aggressive pursuit and sense of urgency

Client Needs Assessment, Client's Decision Criteria, Influencers, and Decision-makers: assistance in mining potential opportunities for information to clearly identify needs, establish project decision-criteria, and target influencers and decision-makers with pre-proposal persuasion

Concepts, Strategies, and Tactics: shaping pre-proposal and proposal concepts, strategies, and actions to pre-sell the work and the selection, establish unfair advantage for firm

Teamwork, Motivating, and Performance Management: creating the drive for collaboration and bridging gaps to form teams intent on winning and sustaining/advancing the competitive position

Engineering and Technical Support Elements: understanding and facilitating bringing the resources to bear to create winning proposals and secure sound contracts, helping establish prototype delivery model

Construction, Operations, and Maintenance Elements understanding and facilitating bringing the resources to bear to create winning proposals and secure sound contracts, helping establish prototype delivery model

Systems and Processes: building, using, and improving systems and processes for efficiency and effectiveness, resourcefulness by design, supporting organized approaches

Structures: Functional Groupings, Matrix, Studio, Inter-Group / Inter-Organization: adapting fluidly to the full range of organization and project models, progressing in real time using the Tuckman Model

Concrete Strategies and Planning: creating and refining descriptions and depictions of strategies and plans, assisting in developing detailed plans that address client needs, constraints, process requirements, schedule, budget, and quality standards

Continuity and Collaboration: sustaining and enhancing collaboration and compromise, morphing, interchange

Communications, Persuasion, and Closing: writing and creating graphic communications of complex thoughts in clear, concise, convincing ways; overcoming objections to selection

Contracts Coordination and Compliance: negotiating and establishing an integrated set of contracts and logistical agreements to implement projects, establishing compliance requirements, monitoring, and assurance measures

Coordinated Project Startup and Implementation: helping construct initial work plans, project flow diagrams, organizational diagrams, schedules, budgets, milestones, deliverable contents/mockups; establishing compliance and performance metrics; arranging and leading kick-off meetings

Continual Improvement and Change Management: critical analysis of processes, products, performance, issues, successes, shortfalls, results; recommending improvements, adjustments, and continuance

Company Business Results: shaping proposals for profitability, helping secure sole-source work – initial and follow-on, assisting and fostering client sustainability, participating in organizational improvement and growth,

Highlights of Accomplishments Relevant to Blue Water Civil Design

Sparrow Hawk Engineering, LLC
Travelers Rest, South Carolina 10/14 - Present
Founder, Managing Principal

- Founded and started up the firm, including The Sparrow Hawk Institute.
- Performed detailed forensic engineering covering 60 years of operations and testified as the sole expert for a global chemical company, as plaintiff, in a $50 million case.
- Developed all literature for Sparrow Hawk Engineering, LLC and the Sparrow Hawk Institute.
- Developed a comprehensive health and safety management system for a North Carolina contractor.

Kestrel Management Services, LLC / Kestrel Horizons, LLC
Greenville, South Carolina 4/98-10/14
Co-Founder, Managing Principal

- Co-founded the environmental engineering, management, and science consulting firm in 1998.
- Led the development and operation of the firm's service to industry, government, and legal counsel in 15 states
  - power (coal, gas, nuclear fuel, waste-to-energy), chemical, foundry and secondary smelting, mining and minerals processing, aerospace, marine port and ship restoration, legacy sites;
- Led Kestrel in these specific areas:
  - project management, engineering, construction and remediation management, contracting, negotiations, performance-based compensation, management systems, cost estimating and options analyses, public communications and interface, risk management, constructive use of secondary materials,
- Conceived and led the ***Good to Great*** programs, including Marketing and Client Development, Project Management, Technical Excellence, Interpersonal Skills Development, and Career Development, resulting in substantial growth and substantial improvements in all five areas as well as overall business performance.
- Led the Trustee services to the Pinewood Site Custodial Trust from April 2003 through October 2014,
  - Can rightly claim having "the eye of the owner" for more than a decade, which is a major element of credibility with industrial clients, regardless of the sector.
  - Managed $65 million in public trust funds over eleven years, closing, operating, maintaining, and implementing major improvements at a 535-acre bankrupt commercial hazardous waste facility that was once the second largest in the US.
  - Managed the Trust Team of Kestrel Horizons, LLC as Trustee – three to ten staff, depending on project intensity;
  - Responsible for all procurement, contracting, performance management, change management, accounting, and payment of all vendors to the Trust, including contractors, consultants, suppliers, attorneys, accountants, and auditors.

- The team procured, contracted, and managed more than 60 contractors, consultants, and suppliers to perform engineering, construction, remediation, scientific, O&M, T&D, and monitoring work.
- The team saved more than $10 million through innovative concepts and management methods, which was roughly equivalent to a full offset of all professional fees and trustee expenses.
- Hired and managed attorneys, accountants, auditors, investment firm, and bank. Issued all payments and held all permits, as Trustee.
- Responsible for compliance with environmental, health, safety, and security compliance, permitting, and activities;
- Developed the web-based Operations Management System for the facility, organizing and linking more than one million pages of documents in a digital system with intuitive navigation and communication with real-time distributed control system information for leachate pumping, storage, and treatment as well as mechanical and electrical systems;
- Led communications and negotiations with regulatory agencies, as Managing Principal of Kestrel Horizons, LLC in its permit holder role as Trustee;

- Implemented Deltek enterprise and project management software – the successor to Harper Shuman.
- Managed the decommissioning and demolition of two former manufacturing facilities and the cleanup of 250 acres of a bombing and gunnery range with full EPCM responsibilities and authority.

RMT, Inc.
Greenville, South Carolina (Southeast Region) 7/88 – 3/98
Positions:

- **Vice President,** 7/86 – 3/98
- **Corporate Task Force Leader and Regional Director of Project Management,** 7/88 – 12/90
- **Corporate Task Force Leader, Remediation and Construction Management,** 1/91 – 12/94 (1993 & 1994 – **Corporate**)
- **Corporate Program Manager, Chemicals, Plastics, and Pharmaceuticals Industries,** 8/95 – 12/97
- **Corporate Program Manager, Metals Treatment Technologies,** 3/93 – 9/95
- **Senior Consultant and Project Director: RCRA, CERCLA, and Environmental Management Systems,** 1988 – 3/98
- **Regional Program Manager, Metals and Automotive Industries, Commercial Waste Industries,** 1/91 – 6/95
- **Regional Director of Client Services,** 1991
- **Regional Program Manager, Solid Waste Management Services,** 7/88 – 12/90

- Formed and directed Project Management, Contracting, Key Client, and Target Market programs.
- Served as chairman of firm's Project Management Task Force and Construction Management Task Force. Wrote the firm's Project Management Manual, a Risk and Liability Management Handbook, and a Project Management Handbook. Developed and led Project Manager, Project Coordinator, and Project Assistant training and career track implementation.

- Led implementation of Harper Schuman project management software, including monthly project performance reviews and coaching for eleven full-time and 15 to 20 part-time project managers (project engineers, project scientists, construction managers.)
- Served as Regional Contracts Manager and often as a principal negotiator. Implemented project performance metrics and project/client targeting and selection.
- Played the agent-of-change role to reduce write-offs from nearly 20% (annual rate) upon arrival in 1988 to less than 4% within one year and less than 1.4% within eighteen months.
- Managed complex projects involving engineering, science, various sub-consultants and contractors, and construction management personnel.
- Served as the go-to person for development of manufacturing and facility process diagrams, project scopes and work breakdown structures, project schedules (esp. time-scaled precedence diagrams and CPM), project work plans and budgets, proposals and change justification, and presentations for complex projects for industry and Superfund PRP groups (committee decision-making dynamic).
- Secured a $520,000 performance-based compensation award on a $1.7 million EMCM project involving removal of 20 acres of ultra-hazardous waste over 16 months. Vote by PRP's was 79 to 2 in favor. No adverse publicity – only positive. No law suits. Only one minor injury, despite constant danger. Crew up to 20 people, including EOD bomb crew.
- Served as integration facilitator for five acquisitions
    - facilitated breaking down of silo walls – geography, discipline, cultural;
    - taught/led numerous interactive internal workshops and seminars;

RMT, Inc.
Madison, Wisconsin (Northern Region) 1/79 – 6/88
Positions:

- **Manager of Engineering,** 6/80 – 7/86
- **Project Manager,** 1/79 – 6/88
- **Vice President and Director of Project Development,** 7/86 – 6/88
- **Senior Consultant, RCRA, CERCLA, and Environmental Master Planning,** 1980 - 1988
- **Manager of Technical Services,** 1/79 – 6/80

- Formed and led Technical Services, Project Management, Construction Management, and Technology Development programs, including recruiting, training, systems, tools, branding, performance, client interface and satisfaction, and continual improvement.
- Developed and sold the flagship projects in hazardous waste, Superfund studies, engineering design and remediation, proprietary technology development, and agency construction management – all profitable and chain-linked.
- Advised plant managers and division managers of medium-to-large companies on alternatives and strategies to minimize environmental constraints and burdens on the growth, change, flexibility, and profitability of the enterprises. Clients included General Motors (three major foundries), the Falk Corporation, Clow Corporation. Professional fees for these five totaled $400,000 to $2.5 million each over eight years. Multipliers were 3.6 to 4.5.

- Often served as lead advocate/negotiator with regulatory agencies in complex regulatory matters and matters of high controversy – *Fortune 500* companies, *Second 500* companies, and privately-held companies;
- Presented and advocated burden reduction and alternative regulatory policies and guidance on behalf of industry trade groups – foundry in many states and nationally, and coal-fired power in Indiana;
- Made presentations regarding status and alternate regulatory and technical strategies to senior management of individual companies and multiple facilities – including the *Fortune One* company at the time;
- made presentations at industrial conferences; wrote technical papers, articles, and primers.

City of Madison – Engineering Division
Madison, Wisconsin
Position: **Civil Engineer,** 5/74 – 1/79

- Served as Project Engineer under two Senior Project Engineers, leading and coordinating engineering and landscape architecture design and all public utility work for an urban renovation project involving rights-of way for 20 city blocks at the center of downtown Madison, Wisconsin. Total budget was $6.2 million in 1977. Crew totals for GC's, specialty contractors, and utility crews and managers topped out at just under 300 in 1977.
  - Prepared all bidding and contract documents, including all technical specifications, except traffic control, for the project an phases.
  - Managed procurement process and contract execution.
  - Served as construction manager and primary interface and negotiator with all contractors and the public. Managed a CM crew of six to nine.
  - served as project design coordinator; detailed designer of streets, storm sewers, and special structures; bidding and contracts manager; and leader of construction management team
  - made numerous presentations to top management and various boards, commissions and committees – Mayor, City Council, business groups, Board of Public Works, Panning Commission, Urban Design Commission, Blue Ribbon Task Force on Property Assessments, State Treasurer, State Attorney General, Secretary of State
  - coordinated work of all public utilities: water, gas, power distribution, sanitary sewer, telephone, and downtown fire alarm communications
  - served as primary interface during design and construction phases with over 100 property owners, including businesses, institutions, and State government (State Capitol security included)
  - led and managed construction quality assurance team during construction – including most coordination and negotiations with contractors and utilities

Toltz, King, Duvall, Anderson, Inc.

Consulting Engineers and Architects
St. Paul, Minnesota
Position: **Civil Engineer-in-Training,** 1/74 – 5/74

- Performed quantity and cost estimating for all site work on the 50 acre project, including earthwork, storm and sanitary sewer piping, service water piping, paving, and concrete structures for utilities and access. Estimate of approximately $6.15 million prepared within six work days with a scale, two triangles, two red pencils, and

computation pad was within 1.5% of the estimate prepared over six weeks by two engineers and one technician using a main-frame computer.
- Was promoted within two months of first day.

D'Onofrio, Kottke and Associates
Consulting Engineers and Surveyors
Madison, Wisconsin
Position: **Engineering Technician,** 6/70 – 12/73 (Summer and Part-time work)
- Performed land surveying, construction control surveying, topographic surveying, second order control surveying, construction staking, construction inspection of roads and sewer systems, survey note reduction and plotting, topographic mapping, engineering plan and survey plat drafting, and quantity takeoffs and cost estimating for this public works/land development engineering firm. Three excellent mentor/teachers.

EDUCATION

- B.S. in Civil and Environmental Engineering, University of Wisconsin, Madison – 12/73. Graduated *cum laude*. All but $300 of education paid for by working at engineering firm and managing 32 units of apartments with my wife – who also worked full-time.
  - Offered fully-funded graduate studies: fellowship in structural engineering working on Super-Sonic Transport (SST) design and teaching assistant (TA) position in photogrammetry and remote sensing after completing project using early very high resolution satellite imaging and military intelligence imaging to complete project for NASA. Chose to begin career instead.
  - Offered full fellowship/intern role for law school by prominent national environmental law group. Chose to stay with engineering, but have performed litigation, enforcement, and compliance burden reduction consulting for corporate EHS managers, corporate attorneys, and attorneys in private practice since 1980.

REGISTERED PROFESSIONAL ENGINEER*: South Carolina, North Carolina, Georgia, West Virginia, Wisconsin. Eligible for registration in all states.

Common Career Experience Threads

Business and Financial Management

- Managed business results performance of project managers, principals, and partners.
- Reported to the Regional President and/or CEO.
- Frequently met with and briefed corporate executive managers.
- Served on Management Committee.
- Managed accounting, budgeting, budget vs actual, and financial reporting for Pinewood Site Custodial Trust - $65 million over eleven years.
- Implemented Harper Shuman and Deltek (the successor to Harper Shuman) enterprise and project management software.
- Performed business risk management and auditing.

Communications – Written, Graphic, Oral

- Very strong collaboration, communication (both oral and written) and interpersonal skills with a customer-oriented focus.
- Have written and presented strategic briefings and explanations of technical, regulatory, economic, and socio-political aspects of serious issues for industrial clients since 1979;
- Topics have included business risk and liability exposure management, cost recovery actions, class action worker health litigation, cost estimates and profit-harvesting strategies for acquisitions and divestitures, business integration, management systems, delegation and distribution of organizational functions, security, acquisition culture development and integration, cherry-picking and integrating staff of acquisitions, integrating planning and performance metrics into mission-critical business operations, process optimization, and Real Cost and business contribution of organizational functions.
- Discussed environmental issues facing the company with the Chairman of the Board and CEO of General Motors, Roger Smith.
- Presented the Real Cost project for SOCMA to thirty top executives of the chemical industry (EVP, COO, President, CEO level).
- Have written papers, articles, and educational books/booklets.
- Have written hundreds of technical and management reports, including expert opinions.

Common Career Experience Threads

Engineering – Conceptual to Detailed

- Civil and environmental engineering:
  - Engineering design of streets, highways, retaining structures, storm water systems, sanitary sewer systems, major earthwork, stream and river restoration, electrical and natural gas utility routing, underground barrier systems, landfills, surface impoundments, hazardous waste treatment, wastewater treatment, vacuum gas extraction systems, basic vapor incineration systems, foundations.
  - Developed or led the development of complete sets of standard computational methods, design details, specifications, and design processes (concept to concrete).
  - Innovative designs include gas extraction system, vibratory dewatering system, chemical injection system for treatment of hazardous waste in a hydraulic dredge sluice line, creation of rapids from dam remnants and natural stone.
- Managed design process for major projects involving structural, architectural, electrical, instrumentation and controls, mechanical, piping, civil site, and major equipment installation.
- Insuring interdisciplinary collaboration and peer review have been integral parts of all management roles since 1979.

Construction Inspection and Management

- First quality assurance experience was at during college as construction quality assurance inspector on public works and land development projects for a consulting firm.
- Managed, construction of public works improvements (streets, sewers), and construction of the State Street Mall/Capitol Concourse for the City of Madison - construction staking, construction inspection, utility coordination, contractor management, dispute resolution.
- Managed operational sequencing and closure of landfills and surface impoundments.

Procurement and Contracting

- Served as Director of Project Management for RMT and Kestrel, which included management of procurement, development of forms of contract, contract negotiation, change management, training, and auditing.

Common Career Experience Threads

Laws, Regulations, and Standards

- Solid foundation in contract and construction law.
- Grasp of engineering standards and applications.
- Knowledge of environmental, health, and safety laws and regulations.
- Health and safety job hazard assessment and practices evaluation.

Professional, Personal, and Business Ethics

- Served as Trustee, managing $65 million in public funds.
- Served as agent for numerous clients in procurement and construction management.
- Acted on ethical issues in several notable matters.

Client Development, Offers, Closing, and Perpetuating

- Probably the single strongest set of talents.
- Have "sold" concepts, plans, projects, services, and teams since 1977 – to clients and potential firm clients, executives and executive committees, attorneys, internal clients, government agencies and officials, stakeholders, and the public.
- Crafting offers to meet needs, constraints, visions, decision criteria, and decision-maker strategies – and persuading and closing – are long suits.
- One mentor referred to me as "lightning in a bottle".
- See further details.

Developing and Managing People

- Have coached, taught, and sponsored all who were interested and some who were not.
- Style is to find challenges for all teammates and potential teammates – even and sometimes especially those who may be pigeonholed, disregarded, or have raw, untapped potential. This has resulted in some extraordinary success stories.
- Leadership approach is collegial – Brett Favre/Aaron Rodgers.
- Personal ownership of results encouraged.
- Successes celebrated and recognized
- Have directly managed five to fifteen people in line staff structure, five to fifty + people in matrix structure, twenty five as managing principal of consulting firm.

Common Career Experience Threads

- As Managing Principal of Kestrel Horizons, managed the procurement and contracting functions for the Trust, which included procuring, contracting, and managing $50 million in capital improvements, major maintenance, operations, and maintenance of a 535 acre hazardous waste facility. More than 60 contractors, consultants, and suppliers over 11 years.

Project Management

- Have managed engineering and construction projects since 1975.
- Very fortunate to have started in a public works group that provided uncommon technical and management opportunities and support to young engineers.
- From the beginning, I learned the art and science of project management – and have learned and taught since the beginning.
- Projects range from small public works improvements to more complicated engineering and construction projects for industry. Dollar values from $10k to $10 million.
- Excellent in "lifeboat situations", where results are imperative and odds of success are "iffy".

Program Management

- Served as corporate and/or regional program manager for project management, construction management, technology development, chemical industry, metals industries, and commercial waste industry at various times over 19½ years with a large consulting firm.
- Responsibilities included strategic planning, business planning, performance and results management, recruiting, training, mentoring, and corrective action.
- Internal programs included Marketing and Client Development, Project Management, Technical Excellence, Interpersonal Skills Development, and Career Development.

Systems, Tools, and Training

- First systems design exposure was in 1971 – graduate level course in Systems Modeling Techniques. Was smitten then.
- Have used and taught systems design and QA/QC principles and methods for more than 35 years.
- Developed project management manual and training programs for Project Management at

Common Career Experience Threads	Common Career Experience Threads
Teamwork and Collaboration ○ Have taught and mentored employees and peers on collaboration, conflict resolution, and negotiations since 1980. ○ Served as "Ombudsman" at RMT for several years in total, working to integrate acquisitions that took our company from 40 in two offices to 850 people in 25 offices - 21 US and four international. ○ Worked for eleven years to insure the Pinewood Site Custodial Trust team would work very collaboratively with consultants, contractors, and suppliers – 60 entities in total. ○ As senior manager and company founder fostered collaboration and led formal programs and company culture development - inter-disciplinary, among people in different geographic locations, with other consultants and academics, with attorneys, with clients' corporate and facility staff, and with regulatory agency staff (as appropriate to goals and dynamics of the situation). Negotiations and Conflict Management ○ Have written handbooks and taught negotiations and conflict resolution since 1980 ○ Frequently called upon to spearhead regulatory negotiations for industrial clients ○ Use a personal adaptation of Moulton-Blake, as well as the Tuckman Model, Polarity Management, and timeless concepts of Herb Cohen and Chester Karrass.	RMT and Kestrel Horizons. ○ Systems, tools and training for: strategic thinking, master planning, project management, construction and remediation management, cost estimating and options analyses, procurement methods, contracting, negotiations, performance-based compensation, management systems, public communications and interface, risk and liability management, environmental, health, safety, and security management. Continual Improvement ○ Continual Improvement Model (e.g., Deming Model). ○ Have taught Deming principles and Continual Improvement Model – with variations – since 1985. ○ Incorporated Continual Improvement in project management and construction management programs of RMT, Inc., Kestrel Horizons, LLC, and the Pinewood Site Custodial Trust. ○ Customers are external and internal. I take a Deming view. ○ Have designed management systems for industrial clients and the Trust embedding continual improvement – cultural as well as web-based system design for collaboration and documentation.

Experience Highlights @ Kestrel Horizons, LLC

Bill was a co-founder, majority owner, and Managing Principal of Kestrel Horizons, LLC, an engineering, science, and construction management consulting firm in South Carolina, which was founded in April 1998. The concept of Kestrel Horizons was to stay small (like a kestrel aka "sparrow hawk"), and to select and develop team members as highly capable and versatile managers and technical experts. Kestrel approached client service by linking with other firms and individuals as needed.

Kestrel's expectations of team members were extraordinary and the team nearly always helped clients to produce extraordinary results. Kestrel put a good deal of effort into Human Performance Improvement, which was a central goal of the company's ***Good to Great*** program. Kestrel's focus on mentoring, systems, tools, training, and highly selective recruiting worked, and Kestrel was a lightning rod for projects and roles very few others would or could take on. Kestrel's concise qualification literature tells the story.

Bill led Kestrel's Engineering, Project Management and Construction Management programs. At Kestrel Horizons and RMT, Bill served as project manager and senior consultant to clients for management of environmental site liabilities, strategic management of asset and corporate acquisitions and financial responsibility, and Sarbanes Oxley compliance, design and implementation of environmental remediation and site redevelopment projects, and innovative approaches to environmental, health and safety (EHS) management.

In 2003, Kestrel Horizons, LLC, assumed the role of Trustee of the Pinewood Site Custodial Trust. From December 2003 through October 2014, Kestrel managed more than $65 million in closing, operating, maintaining, monitoring, and remediating the TSD units and solid waste management units. The Pinewood Site, at one time the second largest commercial hazardous waste facility in the country, includes hazardous waste storage, treatment and landfill facilities.

The Trust was created as part of the resolution of the bankruptcy case of Safety-Kleen. Bill led Kestrel Horizons in operating the Trust, and Kestrel, as Trustee, held all operating permits, including the major RCRA TSD permit, the air management permit, a mining permit, and the storm water permit for this 535 acre site.

The hallmarks of Kestrel Horizons were interdisciplinary collaboration, ability to work cooperatively with other consultants and managers of client organizations, ability to manage team efforts to accomplish work and results that were often well beyond reasonable expectations, and strong mastery of the art and science of managing engineering, construction, and business results.

Bill served as Team Leader and principal system designer for SOCMA's Project Real Cost Pilot. Designed and led the testing of an Activity-Based Costing model to define the total cost of environmental, health, and safety management for industrial companies.

Bill managed the Responsible Care® Management System project for SOCMA and served as the "Knowledge Expert" on QTech Systems, Inc.'s *Responsible Care® Management System Software Development* Project Team.

Key Elements

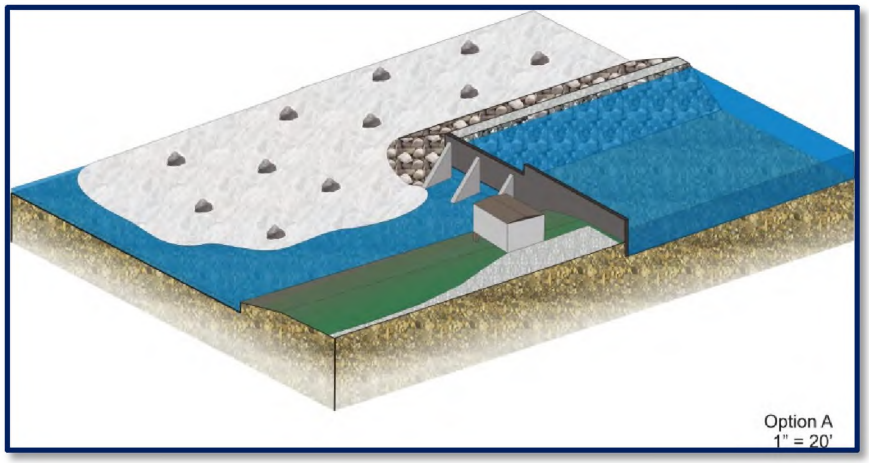
All of the following were integral to the operations and success of Kestrel Horizons, LLC:

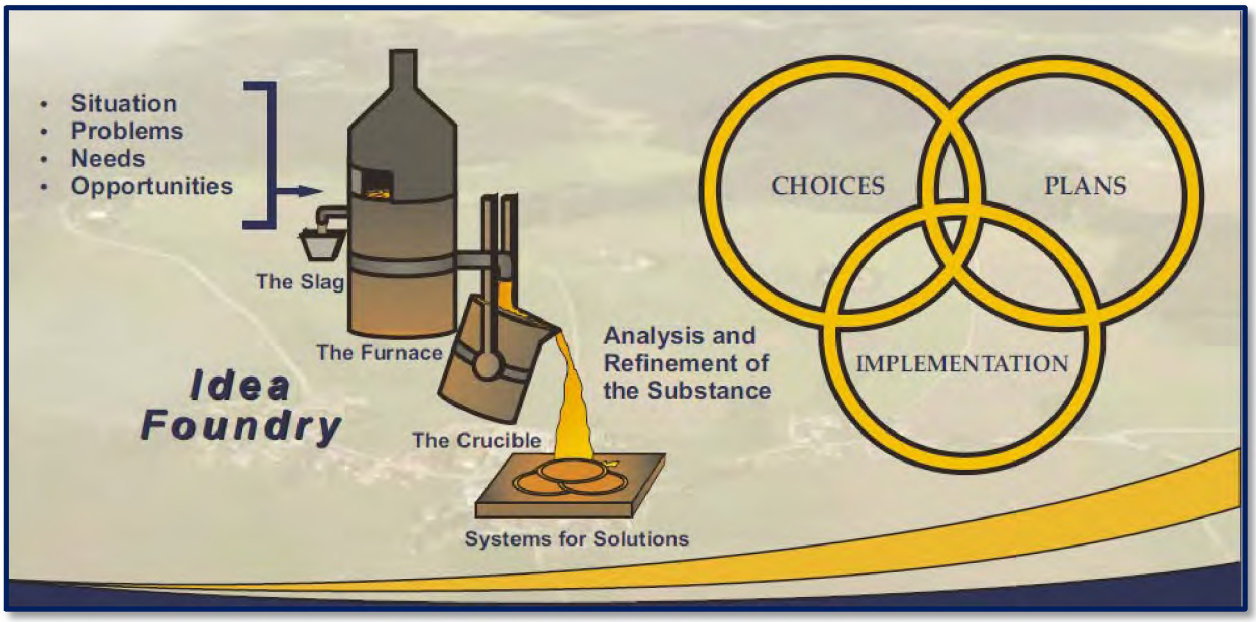
- **Grasping Situations and Seizing Opportunities**
- **Client Needs Assessment, Client's Decision Criteria, Influencers, and Decision-makers**
- **Concepts, Strategies, and Tactics**
- **Teamwork, Motivating, and Performance Management**
- **Engineering and Technical Support Elements**
- **Construction, Operations, and Maintenance Elements**
- **Systems and Processes**
- **Structures: Functional Groupings, Matrix, Studio, Inter-Group / Inter-Organization**
- **Concrete Strategies and Planning**
- **Continuity and Collaboration**
- **Communications, Persuasion, and Closing**
- **Contracts Coordination and Compliance**
- **Coordinated Project Startup and Implementation**
- **Continual Improvement and Change Management**
- **Company Business Results**

Experience Highlights @ Kestrel Horizons, LLC	Key Elements

Here, in bullet form, are the highlights related to the position:
 	
⌖ Co-founded the environmental engineering, management, and science consulting firm in 1998.
⌖ Led the development and operation of the firm's service to industry and legal counsel in 15 states
  ○ power (coal, gas, nuclear fuel, waste-to-energy), chemical, foundry and secondary smelting, mining and minerals processing, aerospace, marine port and ship restoration, legacy sites.
⌖ Led Kestrel in these specific areas:
  ○ project management, construction and remediation management, contracting, negotiations, performance-based compensation, management systems, cost estimating and options analyses, public communications and interface, risk management, constructive use of secondary materials.
⌖ Conceived and led the Good to Great programs, including Marketing and Client Development, Project Management, Technical Excellence, Interpersonal Skills Development, and Career Development, resulting in substantial growth and substantial improvements in all five areas as well as overall business performance.
⌖ Led the Trustee services to the Pinewood Site Custodial Trust from April 2003 through October 2014.
  ○ Can rightly claim having "the eye of the owner" for more than a decade, which is a major element of credibility with industrial clients, regardless of the sector.
  ○ Managed $65 million in public trust funds over eleven years, closing, operating, maintaining, and implementing major improvements at a 535-acre bankrupt commercial hazardous waste facility that was once the second largest in the US.
  ○ Managed the Trust Team of Kestrel Horizons, LLC as Trustee – three to ten staff, depending on project intensity.
  ○ Responsible for all procurement, contracting, performance management, change management, accounting, and payment of all vendors to the Trust, including contractors, consultants, suppliers, attorneys, accountants, and auditors.
  ○ The team procured, contracted, and managed more than 60 contractors, consultants, and suppliers to perform engineering, construction, remediation, scientific, O&M, T&D, and monitoring work.
  ○ The team saved more than $10 million through innovative concepts and management methods, which was roughly equivalent to a full offset of all professional fees and trustee expenses.
  ○ Hired and managed attorneys, accountants, auditors, investment firm, and bank. Issued all payments and held all permits, as Trustee.
  ○ Responsible for compliance with environmental, health, safety, and security compliance, permitting, and activities;
  ○ Developed the web-based Operations Management System for the facility, organizing and linking more than
	Successful Business Management
	
	Diverse Industrial Clients
	15 States
	
	Service Offering Leadership
	Critical Skills Leadership
	
	Program Leadership
	Continual Improvement
	
	Eye of the Owner
	
	Management and Marketing of Large, Continuing Network of Projects – EPCM, O&M
	
	Management of Project Staff
	
	Management of EPCM, Accounting, Payment, Legal
	
	EPCM for 60 Contractors
	
	$10 million in Savings
	
	Management of Specialty Service Professionals
	
	Compliance Management

Experience Highlights @ Kestrel Horizons, LLC	Key Elements
one million pages of documents in a digital system with intuitive navigation and communication with real-time distributed control system information for leachate pumping, storage, and treatment as well as mechanical and electrical systems. ○ Led communications and negotiations with regulatory agencies, as Managing Principal of Kestrel Horizons, LLC in its permit holder role as Trustee. ⌖ Implemented Deltek enterprise and project management software – the successor to Harper Shuman. ⌖ Managed the decommissioning and demolition of two former manufacturing facilities and the cleanup of 250 acres of a bombing and gunnery range with full EPCM responsibilities and authority.	Complex Information Management Systems Design Regulatory Communications and Negotiations Enterprise and PM Software Complex Decommissioning and Site Cleanup





Experience Highlights @ RMT, Inc.

As a manager at RMT, Inc. for 19 years, Bill led the formation of the engineering, construction management, project management, applied technology, and EHS management systems programs. Among other roles, he served as Director of Engineering and Construction Services, Director of Project Management, Director of Client Service (essentially Director of Marketing and Client Development), and Director of Hazardous Waste Services.

Bill managed major projects, as well as entire industry programs, for the Metals, Chemicals, and Commercial Waste industries.

Bill led Task Forces in Project Management, Construction Management and Technology Development for this major EHS/manufacturing design consulting firm. Bill personally authored, conceived or edited most of the Project Management tools, guidance, and training materials. He led training in project management, consulting and problem-solving skills, teamwork and conflict resolution, and innovative techniques. Bill developed and taught problem definition, master planning, purpose-based design, and client advocacy methods.

As Director of Project Management in the Southeast Region, Bill established Project Management as a career path and set up the Project Manager In Training program, as well as Project coordinator, Element Leader, and Project Assistant roles. This gave legitimacy and structure to the Project Management function – and the business and personnel development results were remarkable. Client satisfaction and repeat business increased steadily.

Bill developed and led the Construction Management services for RMT, Inc. He developed standard contracts, sub-contracts, procedures and systems for construction of environmental projects. Bill served as Contracts Manager for the Southeast Region.

Bill was a Vice President of RMT for 12 years and led acquisition integration and partnering with other firms during that time. He served as "Ombudsman" at RMT for several years in total, working to integrate acquisitions that took our company from 40 in two offices to 850 people in 25 offices - 21 US and four international;

He developed sets of RCRA/HSWA compliance manuals and conducted RCRA compliance training for groups of ten to one hundred – including GM Central Foundry Division environmental managers in 1980. Assisted in development of EHS management systems and led training for up to thirty.

Bill served as Project Director for a PRP Group-led Emergency Removal Action at AquaTech/Groce Labs, a commercial hazardous waste recycling and treatment facility that received hazardous and ultra-hazardous wastes, drugs, munitions, biomedical wastes, and asbestos-containing materials over a 14 year operating period. The team secured a performance-based compensation bonus of $520,000 on a $1.7 million base contract.

One of Bill's most important and lasting contributions to RMT was the integration of project management and client development principles and practices into a Target Market and Key Client Program, which he conceived and pioneered in the Southeast Region and helped incorporate throughout the company.

Key Elements

All of the following were integral to the operations and success of RMT:

- **Grasping Situations and Seizing Opportunities**
- **Client Needs Assessment, Client's Decision Criteria, Influencers, and Decision-makers**
- **Concepts, Strategies, and Tactics**
- **Teamwork, Motivating, and Performance Management**
- **Engineering and Technical Support Elements**
- **Construction, Operations, and Maintenance Elements**
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- **Contracts Coordination and Compliance**
- **Coordinated Project Startup and Implementation**
- **Continual Improvement and Change Management**
- **Company Business Results**

Experience Highlights @ RMT, Inc.	Key Elements
Here, in bullet form, are the highlights related to the position: ⌖ Formed and directed Project Management, Contracts, Construction Management, Key Client, and Target Market programs. ⌖ Served as chairman of firm's Project Management Task Force and Construction Management Task Force. Wrote the firm's Project Management Manual, a Risk and Liability Management Handbook, and a Project Management Handbook. Developed and led Project Manager, Project Coordinator, and Project Assistant training and career track implementation. ⌖ Led implementation of Harper Schuman project management software, including monthly project performance reviews and coaching for eleven full-time and 15 to 20 part-time project managers (project engineers, project scientists, construction managers.) ⌖ Served as Regional Contracts Manager and often as a principal negotiator. Implemented project performance metrics and project/client targeting and selection. ⌖ Played the agent-of-change role to reduce write-offs from nearly 20% (annual rate) upon arrival in 1988 to less than 4% within one year and less than 1.4% within eighteen months. ⌖ Managed complex projects involving engineering, science, various sub-consultants and contractors, and construction management personnel. ⌖ Served as the go-to person for development of manufacturing and facility process diagrams, project scopes and work breakdown structures, project schedules (esp. time-scaled precedence diagrams and CPM), project work plans and budgets, proposals and change justification, and presentations for complex projects for industry and Superfund PRP groups (committee decision-making dynamic). ⌖ Secured a $520,000 performance-based compensation award on a $1.7 million EMCM project involving removal of 20 acres of ultra-hazardous waste over 16 months. Vote by PRP's was 79 to 2 in favor. No adverse publicity – only positive. No law suits. Only one minor injury, despite constant danger. Crew up to 20 people, including EOD bomb crew. ⌖ Served as integration facilitator for five acquisitions • Facilitated breaking down of silo walls – geography, discipline, cultural. • Taught/led numerous interactive internal workshops and seminars. ⌖ Formed and led Technical Services, Project Management, Construction Management, and Technology Development programs, including recruiting, training, systems, tools, branding, performance, client interface and satisfaction, and continual improvement. ⌖ Developed and sold the flagship projects in hazardous waste, Superfund studies, engineering design and remediation, proprietary technology development, and agency construction management – all profitable and chain-linked. ⌖ Advised plant managers and division managers of medium-to-large companies on alternatives and strategies to minimize environmental constraints and burdens on the growth, change, flexibility, and profitability of the enterprises.	**Formed and led programs** **Led task forces and wrote procedures and handbooks** **Managed project managers and project information systems** **Managed contracts function** **Reduced write-offs and improved profitability dramatically** **Managed complex projects** **Developed flow diagrams, schedules, budgets, proposals for complex projects and demanding clients** **Secured a $520,000 performance-based compensation bonus** **Served as integration facilitator for five acquisitions** **Formed and operated key service programs** **Sold and developed flagship and portfolio projects** **Advised top management of client organizations**

Experience Highlights @ RMT, Inc.	Key Elements
⊕ Clients included General Motors (three major foundries), the Falk Corporation, Clow Corporation. Professional fees for these five totaled $400,000 to $2.5 million each over eight years. Multipliers were 3.6 to 4.5. ⊕ Often served as lead advocate/negotiator with regulatory agencies in complex regulatory matters and matters of high controversy – Fortune 500 companies, Second 500 companies, and privately-held companies. ⊕ Presented and advocated burden reduction and alternative regulatory policies and guidance on behalf of industry trade groups – foundry in many states and nationally, and coal-fired power in Indiana. ⊕ Made presentations regarding status and alternate regulatory and technical strategies to senior management of individual companies and multiple facilities – including the Fortune One company at the time. ⊕ Made presentations at industrial conferences; wrote technical papers, articles, and primers.	**Consistently sold work with high multipliers over many years** **Served lead negotiator role with regulatory agencies for clients** **Presented proposals as industry advocate** **Briefed senior management of client organizations on alternative strategies** **Made many presentations and wrote articles and technical papers**

Experience Highlights @ City of Madison, WI, TKDA, and D'Onofrio Kottke and Associates	Key Elements
⌖ Served as Project Engineer under two Senior Project Engineers, leading and coordinating engineering and landscape architecture design and all public utility work for an urban renovation project involving rights-of way for 20 city blocks at the center of downtown Madison, Wisconsin. Total budget was $6.2 million in 1977. Crew totals for GC's, specialty contractors, and utility crews and managers topped out at just under 300 in 1977. ○ Served as project design coordinator; detailed designer of streets, storm sewers, and special structures. ○ Prepared all bidding and contract documents, including all technical specifications, except traffic control, for the project an phases. . Managed procurement process and contract execution. ○ Made numerous presentations to top management and various boards, commissions and committees – Mayor, City Council, business groups, Board of Public Works, Panning Commission, Urban Design Commission, Blue Ribbon Task Force on Property Assessments, State Treasurer, State Attorney General, Secretary of State. ○ Served as construction manager and primary interface and negotiator with all contractors and the public. Managed a CM crew of six to nine. ○ Led and managed construction quality assurance team during construction – including most coordination and negotiations with contractors and utilities. ○ Coordinated work of all public utilities: water, gas, power distribution, sanitary sewer, telephone, and downtown fire alarm communications. ○ Served as primary interface during design and construction phases with over 100 property owners, including businesses, institutions, and State government (State Capitol security included). ⌖ Performed quantity and cost estimating for all site work on the 50 acre project, including earthwork, storm and sanitary sewer piping, service water piping, paving, and concrete structures for utilities and access. Estimate of approximately $6.15 million prepared within six work days with a scale, two triangles, two red pencils, and computation pad was within 1.5% of the estimate prepared over six weeks by two engineers and one technician using a main-frame computer. ⌖ Performed land surveying, construction control surveying, topographic surveying, second order control surveying, construction staking, construction inspection of roads and sewer systems, survey note reduction and plotting, topographic mapping, engineering plan and survey plat drafting, and quantity takeoffs and cost estimating for this public works/land development engineering firm. Three excellent mentor/teachers.	**Served as Project Engineer/Project Coordinator/Construction Manager for large, complex project** **Developed detailed engineering drawings and prepared technical specifications** **Prepared all bidding documents, managed procurement process and contract negotiation and execution** **Made many presentations** **Served as construction manager and supervised crew** **Coordinated work of all utility companies and contractors** **Served as public interface.** **Performed quantity and cost estimating on very large project** **Performed engineering, surveying, and construction support on a variety of projects**

William A. Stephens, P.E.

May 2016

Engineering and Construction/ Restoration Management Overview

My consulting work for 35 years has been strongly rooted in his early engineering and construction management experience.

From age 19 to 22, while attending the University of Wisconsin (then one of the top five engineering schools in the US) in Civil and Environmental Engineering, I worked as a surveyor, performing property boundary surveys, topographic surveys, construction control staking, and inspection of dredging and river restoration projects.

In the first five years after graduating, at TKDA and the City of Madison Wisconsin, I began a run of good fortune that would last the next 40 years. Design projects, under dedicated mentors who became lifelong friends, included site work for an 80 MGD addition to a POTW, phasing and fill sequencing for two MSW landfills, one of the first active landfill gas management systems in the US, and the streetscape and storm water management for a large urban mall system in the heart of downtown Madison.

For all but the POTW design work, I served as field engineer and/or construction manager – implementing the designs in the field and serving as primary interface with contractors, property owners, and neighbors. I also made many presentations to boards, committees, commissions, business groups, and senior managers.

At RMT and Kestrel Horizons, my work was always grounded in his engineering and construction management education and experience, which requires a blend of systems and situational thinking.

I developed and led the Construction Management services and supervised construction management personnel for RMT, Inc. and Kestrel. This included developing standard contracts, sub-contracts, procedures and systems for construction management of environmental projects. Projects included industrial landfill development and closures, CERCLA removal and remedial actions, surface impoundment closures, in-situ treatment of soils and groundwater, and major demolition. For several years, I served as Contracts Manager for the Southeast Region.

We closed Kestrel Horizons in October 2014 and concentrated on completing the restoration of a two story brick schoolhouse built in 1921 for my wife's real estate restoration company, Sparrow Hawk, LLC. The schoolhouse was put on the market in July 2015 and has had hundreds of visitors since.

The Locust Hill Schoolhouse a very important historic preservation accomplishment for residents of Travelers Rest and Taylors, South Carolina – and for Greenville County as a whole. The schoolhouse has a 25 ft. cathedral ceiling with massive trusses on the second floor; the free-span room was the original auditorium and community gathering place. Word of our "ingenious, but old school" construction methods to save the schoolhouse has apparently gotten around, and contractors call to see if they can have "the engineer's tour".

I have decided to return to some version of the work I did for 40 years after considering focusing on restoration of landmark buildings. That focus will likely resume in ten years.

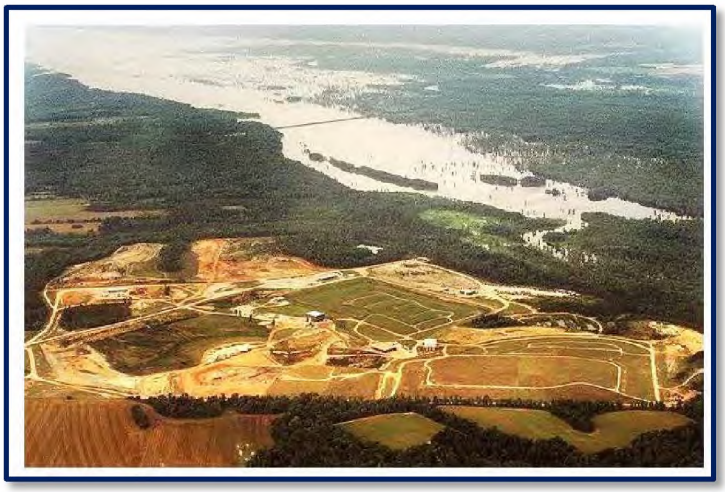
Highlights of Selected Project Demonstrating Range and Depth

Question: What do all of the following have in common?

- Closing a commercial hazardous waste landfill and treatment facility
- Designing and building process expansions
- Dismantling of manufacturing and environmental facilities
- Geophysical surveys and removal of ordnance and explosives at a former World War II bombing range
- Operating and maintaining a 500-acre closed hazardous waste facility for 100 years
- Remediation of highly contaminated soils at a pesticide site
- Removal of PCB-affected sediments and restoration of a river system

- Accounting and Payments
- Budgets
- Community Relations
- Compliance
- Construction
- Contracting
- Decisions
- Environmental Monitoring
- Site and Process Engineering
- Field Engineering
- Forensics
- Investigations
- Operations
- Regulatory Approvals and Permitting
- Schedules
- Technology Application

Leadership of Pinewood Site Custodial Trust Team



In 2003, Kestrel Horizons, LLC, became the Trustee of the multimillion dollar Pinewood Site Custodial Trust. The Pinewood Site, at one time the second largest commercial hazardous waste facility in the country, includes hazardous waste storage, treatment and landfill disposal facilities. The landfill began operation as a clay mine in the 1970s and operated from 1979 through 2000 as a commercial hazardous waste treatment facility and landfill. The Trust was created as part of the resolution of the bankruptcy case of

Safety-Kleen. Kestrel Horizons gained initial approval from DHEC and the United States Bankruptcy Court in April of 2003 to serve as the Trustee for the Pinewood Site Custodial Trust. The Trust assumed operation of the Pinewood Site from Safety-Kleen at the end of 2003, taking responsibility for closure and post-closure activities.

As part of the Trust, Kestrel procured contractors and consultants to manage all Closure and Post-Closure activities associated with the Pinewood site. Initially, Kestrel Horizons managed $16.7 million in funds, most of which were used in 2004 and 2005 to close the landfill, decontaminate and dismantle most of the buildings used for storage and treatment of hazardous waste, and complete major upgrades in site grading, drainage and roadways.

From December 2003 through October 2014, Kestrel managed more than $65 million in closing, operating, maintaining, monitoring, and remediating the TSD units and solid waste management units. Bill led Kestrel Horizons in operating the Trust, and Kestrel, as Trustee, held all operating permits, including the major RCRA TSD permit, the air management permit, a mining permit, and the storm water permit for this 535 acre site.

HAZARDOUS WASTE LANDFILL HISTORY

Company keeps eye on landfill

State has hired Bill Stephens' firm, Kestrel Horizons, to monitor closed site

By SAMMY FRETWELL
Staff Writer

PINEWOOD — Buzzards circled silently above the stark landscape as Bill Stephens drove his late-model SUV through a place filled with industrial toxins.

The sport utility vehicle slogged past rusting test wells, abandoned cargo trailers and brown, desolate fields. At the bottom of one 60-foot-deep hole, steel drums bobbed in metallic-green water. Nearby, men wearing protective masks pumped hazardous liquid from huge vats into a tanker truck.

This foreboding spot threatens to pollute South Carolina's largest lake — and it is Stephens' job to make sure that doesn't happen.

That's no small task.

His company, Kestrel Horizons LLC, was hired by the state and will receive $5 million to monitor and maintain the closed landfill, according to Safety-Kleen bankruptcy records. Money to maintain the landfill will come from a $140 million annuity Safety-Kleen bought to take care of the site for 100 years.

The dump once was one of only three commercial hazardous-waste landfills in the South. It was used by businesses and industries from around the country.

"We know we can do the job," Stephens said on a recent spin through the dump.

Unlike the grim landfill, Lake Marion is a scenic, relatively pollution-free fishing haven that one day will be used for drinking water. Leaders from four counties expect to break ground on a regional water plant later this year.

Lake Marion, however, lies just four football fields from the toxic waste dump. Groundwater from the landfill flows mostly toward the lake. And at least one of the synthetic liners under the landfill is vulnerable to leaks, studies show.

Buried in the landfill are more than 5 million tons of hazardous garbage from industrial sites and polluted property. The toxins include acids, caustic chemicals and cancer-causing metals that can build up in the fish people eat.

If pollution escapes into the reservoir, it could ruin drinking-water supplies and drive away thousands of anglers who fish for bass and bream in the 100,000-acre lake.

As the site trustee, Kestrel hires and coordinates the work of contractors. It also maintains buildings and equipment left by Safety-Kleen.

A contract worker inspects a tanker truck after pumping hazardous liquid from the landfill for disposal in New Jersey. Kestrel is trying to organize records left behind by the company that could help guide its lengthy mission.

A key task in pumping toxin-laced water out of the landfill so it doesn't seep through the bottom of the dump.

No one is sure how the water called leachate got there. Stephens and state regulator David Wilson said it's probably from past rainfall or leaking waste drums buried long ago in the oldest pit.

Kestrel also must watch for signs if a pollution spill moving underground toward the lake by regularly checking more than 180 test wells. And the company must make sure the remaining open pit is lined with a synthetic sheet, filled with dirt and sealed off.

Crews eventually will cover all of the rolling, man-made hills above the closed waste pits. Trees with deep roots will not be allowed to grow there.

"It will be tedious, time-consuming and exacting," Stephens said of the job ahead.

Some people question whether anyone can protect the lake.

They cite the flaw of groundwater toward the lake, the high water table surrounding the dump and the questionable durability of the synthetic liners.

"The real phrase — that this is a ticking time-bomb — is used all the time. In this case, it really fits," said Jimmy Chandler, a Sierra Club lawyer who used to close the dump before Safety-Kleen declared bankruptcy in 2000.

Stephens said his company took the maintenance job because it presents a challenge for him and two partners who formed Kestrel six years ago.

Stephens, David Nichols and Tom Devine all worked for RMT Inc., a national environmental consulting firm from Wisconsin with offices in Greenville. Each has decades of experience and did some work for Safety-Kleen.

Safety-Kleen recommended Kestrel for the job, Wilson said his agency thoroughly checked out Kestrel's credentials before choosing it as the site's trustee.

LANDFILL DURABILITY QUESTIONED

LANDFILL MONEY

Safety-Kleen left South Carolina financial commitments of more than $250 million to close, monitor, maintain and clean up the old hazardous waste landfill near Lake Marion.

Total cleanup funds for pollution spill from the landfill: $49 million

Total to close, monitor and maintain the site for 100 years: $156 million

SUPERFUND

Excerpted from "The State", June 13, 2004

As part of the trust, Kestrel procured multiple contractors and consultants – 60 in all - to carry out all closure and post-closure activities associated with the Pinewood site. Initially, Kestrel managed more than $13 million in closure funds to be employed during the closure period, ending in 2005. The closure of the landfill was a complex undertaking that requires a central resource to manage multiple activities.

Kestrel managed a post-closure annuity that generated one to two million dollars each year, as well as supplemental funds from the bankruptcy, providing for ongoing activities at the Pinewood site. As Trustee, Kestrel worked cooperatively with governmental officials and all parties involved to effectively manage this hazardous waste facility. From 2007 through 2014, Kestrel managed major improvements in mechanical, electrical, and electronic systems for hazardous waste management that totaled more than $12 million in construction costs.

As the Trustee, Kestrel conducted all activities in accordance with detailed permits, regulations and agreements related to environmental statutes and participated in public meetings regarding work progress.


Abandoned, Partially Constructed Hazardous Waste Landfill Cell


Initial Stage of Completion of Abandoned Construction Closure Cell

Kestrel Horizons, as Trustee, established the confidence of all parties in early 2004 - quickly overcoming the total lack of credibility of the former commercial waste companies who operated the facility for 24 years with the public and intervenors to the bankruptcy-based settlement between SC DHEC and Safety-Kleen (and Laidlaw by inclusion in the various suits).

Specific closure and post-closure activities of the Pinewood Site included:

- Completion of final six acres of the Subtitle C landfill liner system
- Excavation of more than 100,000 cubic yards of contaminated soils from oil recycling operations and treatment of the most contaminated soil
- Filling and installing a Subtitle C landfill cover (13 acres total)
- Decontamination and dismantling of several treatment and storage buildings
- Installation of passive treatment systems for groundwater

Re-grading of the site, with major storm water management improvements

- Continuous leachate pumping from 75 extraction points within the landfill
- Design and construction of an innovative leachate and sludge treatment system for hazardous leachate

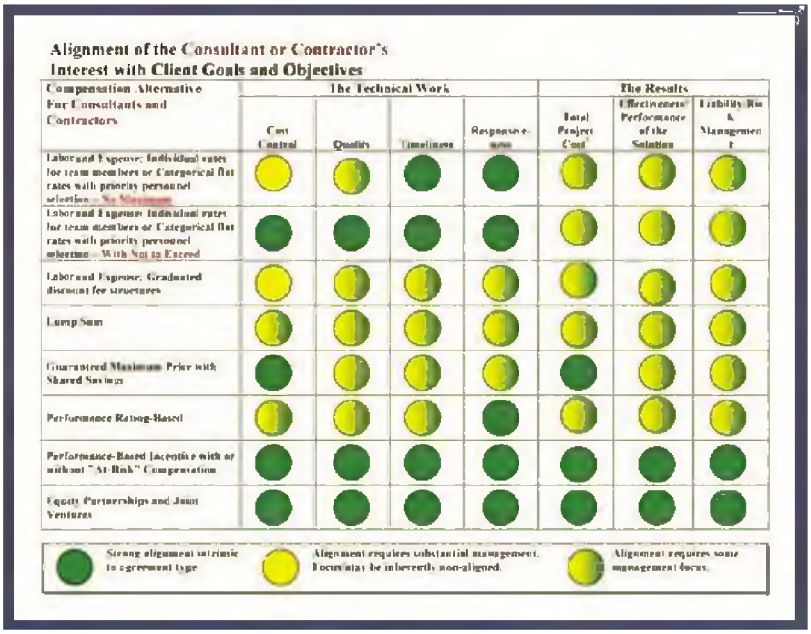
- Major upgrades in piping, electrical distribution and controls, instrumentation and computer (DCS) monitoring and control system, security, and containment of hazardous wastes.
- Operations and maintenance
- Transportation and disposal
- Management system design
- 3D digital modelling of all natural and manmade features
- Environmental monitoring
- Regulatory compliance
- Property management


Complete Double Composite Liner System

From 2009 through 2012, the Trust undertook a program of major infrastructure improvements and hazardous waste treatment system design and construction. The total cost of the engineering, construction, and startup was approximately $20 million.

Kestrel Horizons, as Trustee, managed all studies, regulatory approvals and permitting, engineering, procurement, contracting, construction, startup, and operations, and maintenance. Procurement methods included competitive bidding, design-build proposal competitions, sole source negotiations, and combinations. Performance-based compensation was employed in some projects.

Hazardous Waste Treatment System



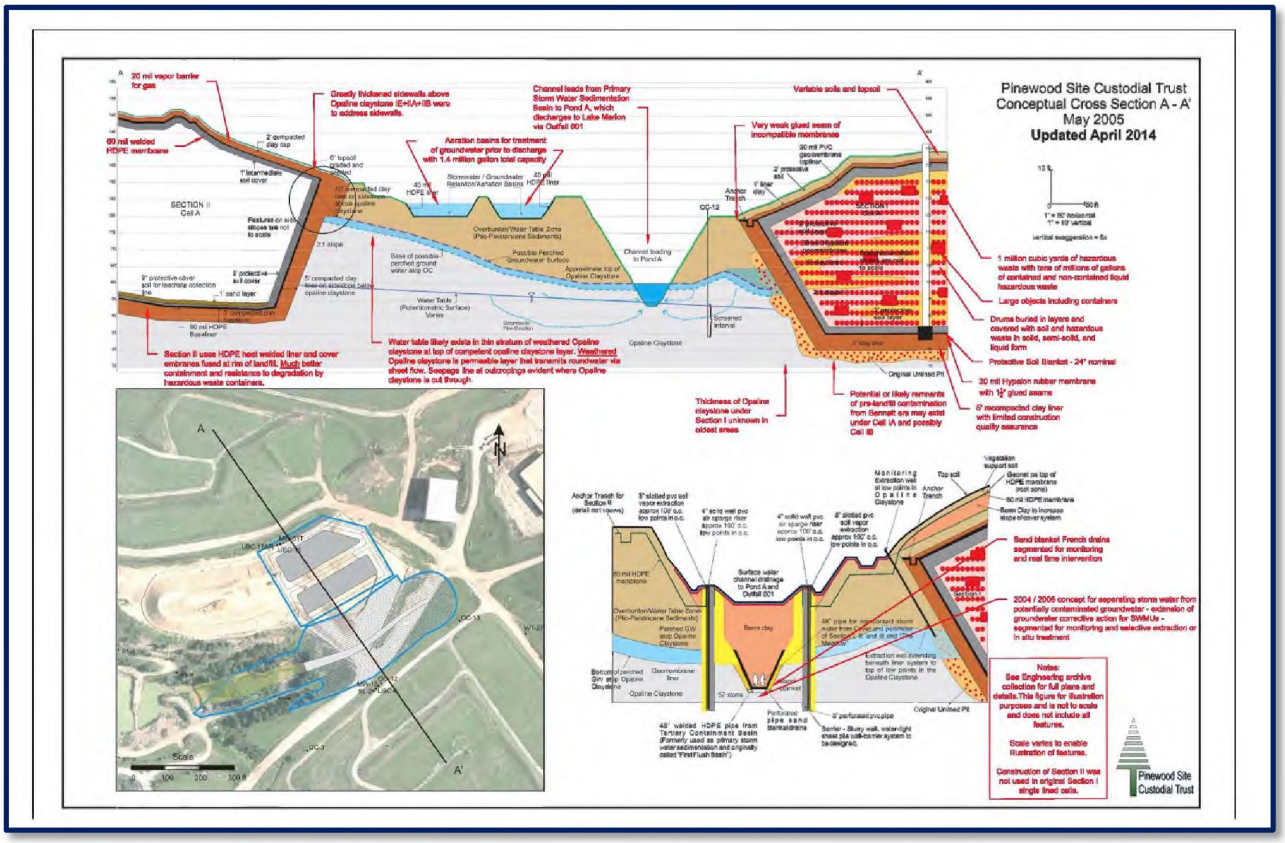
Matrix Depicting Procurement and Contracting Methods

Forensic Analysis of Design, Construction, and Operation of Very Large Commercial Hazardous Waste Landfill

Led forensic analysis of design, construction, and operation of the Pinewood Commercial Hazardous Waste Landfill facility in 1991 after a major embankment failure and collapse between two landfill cells. Team included geotechnical engineering and synthetic materials experts. Led development of report and testimony before a South Carolina Senate Committee.

Pinewood Hazardous Waste Treatment Facility and Landfill – 1993

Intermediate Slope Failure Similar to the One between Cell IIF and IIG at Pinewood with damage to Newly-Completed Liner System



Forensic Analysis of Most Vulnerable Portions of Pinewood Hazardous Waste Landfill

Design and Forensic Analysis of High Volume/Low Hazard Waste Landfills and Surface Impoundments

Developed conceptual and preliminary engineering and/or led or performed forensic analyses for several high volume/low hazard landfills and surface impoundments. Industries included foundry, secondary smelting, minerals processing.

Led development, permitting and implementation of innovative *in-situ* methods to address slope stability for unlined landfills and impoundments - and to control significant releases of arsenic, selenium, lead, cadmium, and chromium. Several facilities were located immediately adjacent to streams, rivers, and wetlands.

Conducted various forensic analyses on land-based facilities, including berm/dike/levee stability and alternatives for buttressing, stabilizing, and replacing the earthen structure. One such analysis was pre-acquisition for a very large mining and minerals processing facility in the Caribbean. Developed the conceptual design to buttress and manage saturated conditions and supported a $26 million reduction in purchase price. Immediately after purchase, the buyer completed basic reinforcement and the damage from a hurricane within months of purchase was limited; without the reinforcement and pore-water management actions the 100 foot tall dike would have failed completely and inundated the valley below with minerals processing residuals.

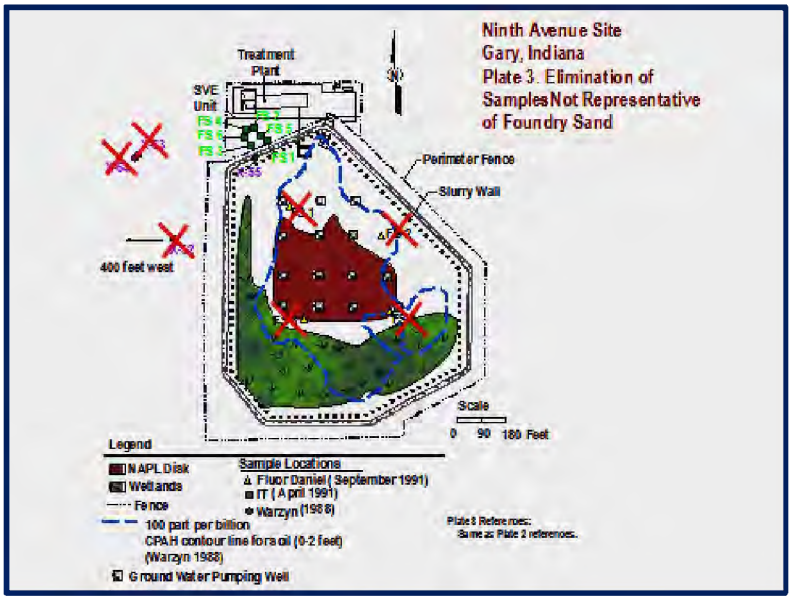
Cutting the Cost of Disposal Through Innovative and Constructive Uses of Foundry Wastes

W. A. Stephens
T. P. Kunes
Reinhardt Management Technology, Inc.
Madison, Wisconsin

ABSTRACT

This paper introduces and develops new outlooks on cost-effective ways of complying with solid waste regulations. Technical aspects of several options which are available, in concept, to a large number of foundries are discussed in detail. The economics of implementing the alternatives discussed are presented in a manner which will allow individual foundries to make a preliminary evaluation of the potential cost savings for their own situations. In addition, the regulatory aspects of implementing the alternatives presented are reviewed.

INTRODUCTION



IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF INDIANA
HAMMOND DIVISION

THE NINTH AVENUE REMEDIAL GROUP, et al.,

Plaintiffs,

vs.

ALLIS-CHALMERS CORP., et al.,

Defendants.

NO. 2:94-CV-331

ORDER

This matter is before the Court on 1) the Oral Motion for Judgment Under Rule 52(c), made by Defendant, White Consolidated Industries, Inc., in open court on April 13, 2001; and 2) Defendant White Consolidated Industries, Inc.'s Motion to Bar Non-Evidentiary Attachment to "Plaintiffs' Memorandum to the Court Concerning Certain Questions," filed on April 30, 2001. For the reasons set forth below, the Oral Motion for Judgment Under Rule 52(c) is GRANTED. The Court FINDS that Defendant, White Consolidated Industries, Inc., is entitled to a zero allocation of Site response costs under Rule 52(c). All claims for contribution against White Consolidated Industries, Inc., in this proceeding are DENIED, and the clerk is ORDERED to ENTER JUDGMENT accordingly. Defendant White Consolidated Industries, Inc.'s Motion to Bar Non-Evidentiary Attachment to "Plaintiffs' Memorandum to the Court Concerning Certain Questions," is MOOT. Nothing left pending in this case, the Clerk is ORDERED to close this case on this

Zero Allocation as Opposed to 35% Claimed

Managing Environmental Liabilities for Beneficial Reuse

by William A. Stephens and Thomas W. Devine, Kestrel Management Services, L.L.C., Greenville, South Carolina
Vincent Atriano, Squire, Sanders and Dempsey, L.L.P., Columbus, Ohio

Inside This Story:

- This article outlines what CERCLA liability and Superfund sites mean to foundries involved with beneficial reuse.
- A checklist of do's and don'ts for beneficial reuse is provided as well as keys to minimizing Superfund liability exposure.
- A recent federal court ruling on CERCLA liability is reviewed, providing hope for foundries.

U.S. foundries have practiced beneficial reuse of sand, slag, dust and sludge for as long as the industry has existed. For the past two decades, extensive efforts in the U.S. to establish environmental standards and regulatory vehicles for beneficial reuse have been overshadowed by the possibility of incurring liability under the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or Superfund) at a site where foundry materials were beneficially reused. Since the costs for cleanup of Superfund sites often have been allocated to generators of waste containing hazardous substances based upon relative volume, foundries have been pursued for large shares of the cleanup costs—often amounting to several million dollars.

This article outlines methods and tools that foundry owners and operators can use to minimize exposure to potential CERCLA liability for the beneficial reuse of their foundry wastes. Included is a brief discussion of a recent federal court decision that provides a roadmap for limiting CERCLA liability for the foundry industry.

Disposal and Beneficial Reuse Regulation

Everyone who has ever worked in a foundry knows that sands, slag, dust and sludges have been used for virtually every constructive purpose for which soil and rock are used. That's because these foundry process materials come from soil and rock. Like virtually all material from industrial processes, foundry process materials are regulated as waste unless and until they can be shown to qualify for exemptions or less stringent disposal requirements.

In states that have established beneficial reuse standards for foundry process materials, the exemptions and/or less stringent management standards are part of the regulations that govern solid waste disposal.

AFS has worked since the mid-1970s to promote beneficial reuse and to establish the technical foundation for reasonable standards for foundry waste disposal and beneficial reuse. Table 1 summarizes some of the major milestones to date. These research and government relations efforts have saved foundries of all types and sizes untold dollars. In some cases, the savings may have been significant enough to keep a foundry financially viable in lean times.

In addition, foundry residuals have been used as a substitute for tens of millions of cubic yards of soils, saving hundreds of millions of dollars. One construction project alone in the mid-1980s made use of nearly one million cubic yards of foundry sand and slag as a substitute fill.

From a public policy standpoint, beneficial reuse makes economic and

Table 1. Major Milestones for Reasonable Beneficial Reuse and Disposal Standards

1978 to Present
AFS research and efforts with state environmental regulatory agencies create beneficial reuse exemptions and more appropriate waste classification and disposal standards in solid waste regulations.

1980
AFS research and government relations efforts eliminate foundry emission control dust and sludge from hazardous waste listing K061, which became limited to emission control dust/sludge from the primary production of steel in electric furnaces.

1984
AFS research and government relations efforts create exemption from double liner requirements for hazardous foundry waste landfills, surface impoundments and waste piles (Hazardous and Solid Waste Amendments of 1984 reauthorizing RCRA).

Management of Ultra-Hazardous Commercial Waste Site Removal Action

This emergency removal action of hazardous and ultra-hazardous waste was performed in accordance with a Unilateral Administrative Order issued under authority of the Superfund Law by the US EPA to 98 Potentially Responsible Parties (PRPs). These PRPs included industrial companies and institutions that had sent waste to the commercial hazardous waste facility, which was located just off the end on the Greenville Spartanburg airport and a few miles from the BMW facility then being constructed. The PRP group pursued several state and federal agencies for contributions and received in excess of $6 million.

The Field Of Drums

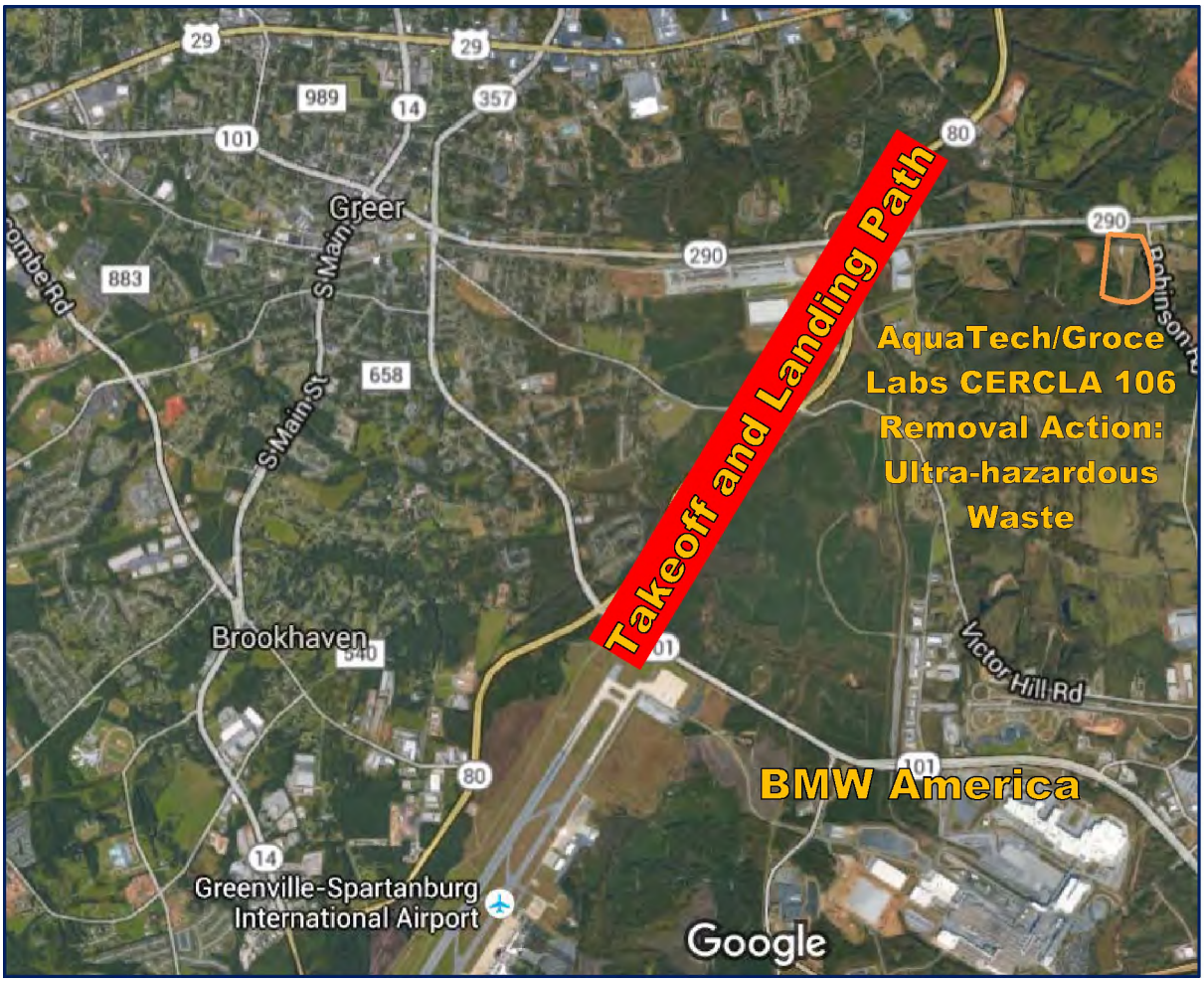
Bill Stephens – then at RMT – directed the emergency removal action, which included 6,200 drums, 1,500 compressed gas cylinders, 1,600 laboratory-packs containing 100,000 items, and 100 tanks. Chemical substances included hydrazine, cyanide, picric acid, phosphine, phosgene, fluorine, solvents, acids, bases, silane, poisons, pesticides, mustard oil (the base for mustard gas), and thousands of unknown substances. Scope included management of Removal Action contractors, scientific and engineering support, database and line-item allocations support, public and media communications, regulatory interfaces and issues management, health and safety management oversight, and cost management.

RMT served as authorized agent for the PRP group. The Removal Action was completed without environmental releases, with an excellent safety record, and a documented savings in excess of $4.5 million, reducing the total cost from $19.5 million to approximately %15 million. Bill negotiated for and the PRP Group awarded $520,000 in performance-based compensation to RMT on the basis of cost and schedule management, quality, responsiveness, and public communications criteria. The base contract was $1.7 million, with a multiplier of 3.2.

The Removal Action was completed with no third-party suits, even though the site was located adjacent to a residential area. The work was completed just in time for cargo jets flying between Germany and the United States for BMW supply and export could use the expanded airport without risks of explosions and releases of gases.

The site had been used for secret operations of the CIA, DEA, ATF, and other federal agencies. It was used for trans-shipment to the Contras under Noriega as part of the Iran-Contra affair. The federal agencies, including the US EPA, apparently believed that "hiding in plain sight" – within a commercial hazardous waste treatment facility with virtually no security – was the way to escape detection. That worked well until the operators went bankrupt and fled. The only substantial effort by the federal government was a "sweep" by "cleaners" during the two weeks before the PRPs took responsibility for the site. The work, which lasted 16 months and required specialty technicians including EOD and poison gas specialists, involved crews up to 20 working in protective suits with supplied air.


Dean Ross Dr
Dean Ross Dr
Robinson Rd
Robinson Rd
AquaTech/Groce
Labs CERCLA 106
Removal Action:
Ultra-hazardous
Waste
Maple Creek
Maple Creek
Google


29
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Greer
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S Main St
658
AquaTech/Groce
Labs CERCLA 106
Removal Action:
Ultra-hazardous
Waste
Takeoff and Landing Path
Brookhaven
540
Victor Hill Rd
80
101
BMW America
14
Greenville-Spartanburg
International Airport
Google

Engineering and Construction Management of Major Urban Renovation Project

Wisconsin State Journal

Thursday
April 14, 1977
Madison, Wisconsin
110 pages ★★★ 20 cents

Carter to kill $50 rebate bid

Gas tax hike all but dead

Florida rejects ERA

Plans ready for Concourse work

Bill Stephens, a civil engineer for the city, does survey work for the Capitol Concourse.

UW's health sciences head quits

Served as Project Engineer under two Senior Project Engineers, leading and coordinating engineering and landscape architecture design and all public utility work for an urban renovation project involving rights-of way for 20 city blocks at the center of downtown Madison, Wisconsin. Total budget was $6.2 million in 1977. Crew totals for GC's, specialty contractors, and utility crews and managers topped out at just under 300 in 1977.

Served as project design coordinator; detailed designer of streets, storm sewers, and special structures; bidding and contracts manager; and leader of construction management team.

Prepared all bidding and contract documents, including all technical specifications, except traffic control, for the project an phases. Managed procurement process and contract execution.

Front Page April 14, 1977

Served as construction manager and primary interface and negotiator with all contractors and the public. Managed a CM crew of six to nine. Led and managed construction quality assurance team during construction – including most coordination and negotiations with contractors and utilities. Coordinated work of all public utilities: water, gas, power distribution, sanitary sewer, telephone, and downtown fire alarm communications.

Wisconsin State Journal

Sunday, June 5, 1977, Section 5

Look

Capitol Square gets a new look

Artist's Rendering of the Capitol Concourse in 1977

Made numerous presentations to top management and various boards, commissions and committees – Mayor, City Council, business groups, Board of Public Works, Panning Commission, Urban Design Commission, Blue Ribbon Task Force on Property Assessments, State Treasurer, State Attorney General, Secretary of State. Served as primary interface during design and construction phases with over 100 property owners, including businesses, institutions, and State government (State Capitol security included).

The Capitol Concourse: Public Rights of Way between Capitol Grounds and Downtown Buildings plus First Block of Radial Streets

Master Planning, Engineering and Technology Development for 150 Acre Combined Industrial Landfill, Hazardous Waste Treatment, Wastewater Treatment, and Sludge Management Facility

Served as Project Manager and Senior Consultant for all RCRA and solid waste management efforts at the General Motors Corporation foundry in Defiance, Ohio from 1979 to 1988. During that period, the facility - one of the largest foundry complexes in the World – generated and disposed on site of nearly 2,000 cubic yards of waste per day.

The General Motors Corporation Defiance, Ohio Foundry Complex from the Air (1982 – At that time the largest foundry in the free world.)

Prepared an environmental master plan for solid and hazardous waste management, incorporating extensive constructive use of wastes, waste minimization, 20 year long-term vertical and horizontal expansion of landfill, sludge de-watering, and wastewater management facilities. The

Photo of Three Dimensional Scale Model

wastewater lagoons and landfill, together occupying more than 150 acres, were unlined and adjacent to the Maumee River. The lagoons received more than 50 million gallons per day of wastewater, and one large lagoon adjacent to the river accumulated more than 300,000 cubic yards of sludge that was classified as EP Toxic (lead).

The landfill, occupying more than 100 acres, had been created by dumping waste in piles more than 40 feet deep and periodically dredging sludge from the lagoons into depressions on the foundry sand and rubble fill. Groundwater monitoring in the late 70's and early 80's showed that arsenic, selenium, sulfate and manganese (among others) were elevated. The foundry has been implementing the long term closure and expansion plan for two and a half decades.

Hydraulic Dredge at GM Defiance

Close-Up View of Physical Model Used with GM Management and Regulatory Agencies

500,000 Cubic Yard Treated Hazardous Sludge Dewatering Basin/Landfill Cell

Conceived the fundamental concepts for elimination of nearly 100,000 cubic yards of hazardous waste per year, and the in-line treatment as part of a dredging project of nearly 350,000 cubic yards of accumulated hazardous sludge. Savings for the sludge treatment process exceeded $20 million compared to best conventional technology in practice at the time. Total savings due to innovative approaches and effective regulatory advocacy and negotiations exceeded $50 million.

Temporary Tank Farm for Phosphoric Acid Used to Treat 350,000 Cubic Yards of Hazardous Melt Emission Control Sludge

Use of Foundry Slag in Landfill and Sludge Drying Bed Construction

Led the design, testing and permitting for the use of foundry slag as a substitute for sand and gravel in the construction of drying layers in landfills and sludge drying beds. (1981/1982)

One of the expensive elements of landfill and drying bed construction is granular materials for the drainage layers. Often, these materials are not available locally, and must be hauled from some distance, at a substantial cost. Since most inorganic and organic sludges dewater by consolidation, with most of the pore water moving laterally, the drainage layers are far more effective if constructed to cover inside slopes, as well as the bottom of landfills and drying beds. That requires even more of the expensive materials.

Foundry slag may be quenched or “pigged.” Quenched slag is usually the size of very course sand, and can be used effectively as a substitute for sand and gravel – provided precautions are taken to minimize the effect of mineral buildup from passing large quantities of water through the slag. This can be done by surrounding the underdrain piping with properly graded sand and gravel. The savings can be very substantial. In the 25 acre combined drying bed / sludge landfill cell, the savings totaled nearly $500,000 in direct costs, plus a similar savings in landfill capacity gained.




Major Hazardous Waste Surface Impoundment and Foundry Landfill Closures and Wastewater Treatment System

Served as Project Manager and Senior Consultant for all RCRA and solid waste efforts at a large foundry in the Midwest from 1981 to 1988. Led the technical work and regulatory negotiations that demonstrated that lead and cadmium were not migrating to the water supply wells, and that lead and cadmium were quickly attenuated, even in the sand and gravel. Led the treatability study effort to develop chemistry to eliminate the generation of hazardous wastewater treatment sludge.

The foundry discharged more than one million gallons per day of 160ºF wastewater from the cupola melting emission control system to a six acre unlined lagoon that had been a gravel pit. All wastewater was discharged to groundwater. The lagoon was adjacent to the company's foundry waste landfill. The sludge in the lagoon was classified as hazardous based on the EP Toxicity criteria (lead and cadmium), and fluoride concentrations in the wastewater discharged to the groundwater were in the range of 5 mg/l. More than one hundred drinking water wells screened in

the sand and gravel aquifer were located within one half mile – the closest was less than 150 feet from the edge of the lagoon.




Urban Redevelopment of Industrial Landfill

Developed engineering plans and secured permits for a foundry landfill, making maximum constructive use of wastes and creating a site for Brownfield redevelopment.

This foundry landfill – in a heavily-developed urban area – began operations in the 1960's. By the 1980's, development of surrounding lands had increased the market value of the 30 acre parcel to more than $1 million each, provided that the landfill could be redeveloped for office complexes or manufacturing.

Plan View of the Redevelopment Plan for the Foundry Landfill.

The company decided to target redevelopment of the parcels, and directed the re-engineering and permitting to pursue that target.

Major Earthwork - Landfill Closures

Provided construction inspection, construction observation and documentation, and construction management for major earthwork projects – primarily landfill closures.

Example Earthwork for Landfill Closures

Major Industrial Waste Landfill before Engineered Closure

Design of Prototype Landfill Gas Control System

Installation of Blower for Landfill Gas Extraction System January, 1976

While working for the City of Madison, Wisconsin in 1975 led the design and supervised emergency construction of one of the nation's earliest active landfill gas extraction well systems. The design became a prototype for future systems, and the construction details and system sizing was widely copied after being initially challenged. The same basic design has been used for nearly 15 years in soil vapor extraction systems for remediation of volatile organic compounds. The system still operates today.

Design of First Lined Cells for Major Commercial Waste Landfill

Designed the first lined cells for a major commercial waste landfill in the Midwest (1981). The cells were designed to accept leachate from the existing un-lined fill, and the leachate collection system was designed to maximize the collection efficiency of the liner. The design was used by the well-known commercial waste company to set the standard for constructability and design presentation.

Constructive Use of Secondary Materials

Worked with clients producing high volumes of secondary materials to establish testing programs, documentation, full-scale field demonstration, and constructive use/beneficial use applications and plans. Industries included primarily ferrous and non-ferrous foundry, secondary smelting, and scrap processing.

Clay Liner Construction with Industrial Secondary Material Core Berms

Led or participated in the detailed characterization of foundry process wastes at more than a dozen major foundries, including grey iron, ductile/malleable iron, steel, brass and aluminum foundries. Led constructive use and reclamation (recycling) projects, including technical research and regulatory negotiations. Provided testimony in Michigan and Indiana that helped create the regulations enabling constructive use of foundry wastes.

Participated in development of and advocated proposed criteria for constructive/beneficial use for individual clients and trade groups. Criteria included methods for sampling and analysis (e.g., DI water leach testing), specified uses and environments for declassification and total deregulation of secondary materials, and periodic documentation of compliance with exemption/exclusion criteria. Met with success in Indiana, Ohio, Michigan, and Wisconsin for a variety of foundry materials. Project-specific success in South Carolina – secondary smelter slag, secondary smelter emission control residuals, coal combustion slag used as blast media.

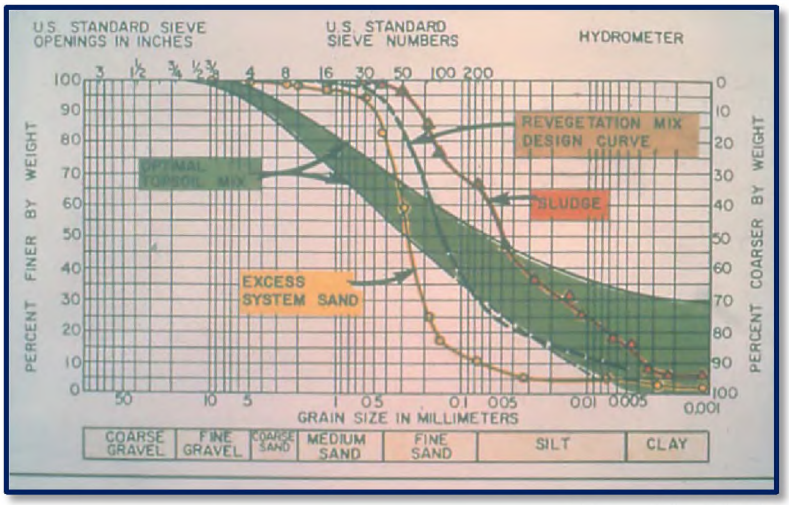
Technical Strategy and Regulatory Negotiations for Recycled Materials Liability Management

Developed and led the implementation of a technical strategy to pioneer exemptions from solid waste rules for foundry wastes being constructively used as a substitute for soils and aggregates. Landmark case involved deregulation of nearly 1,000,000 cubic yards of industrial waste that had been sold by a General Motors Corporation to the State Department of Transportation for use in highway construction. The technical approach and regulatory negotiations resulted in termination of the company's liability exposure, and established a model for use in other states. Subsequent assistance to other companies and industrial trade groups included development of exemption rules and testimony before state regulatory groups. Exemptions involving the basic technical approach developed have now spread to more than a dozen states.

Constructive Use of Foundry Wastes

Developed and led the implementation of a technical strategy to pioneer exemptions from solid waste rules for foundry wastes being constructively used as a substitute for soils and aggregates.

This landmark case involved deregulation of nearly 1,000,000 cubic yards of industrial waste that had been sold by a major automobile manufacturer to the State Department of Transportation for use in highway construction. The technical approach and regulatory negotiations resulted in termination of the company's liability exposure, and established a model for use in other states. Subsequent assistance to other companies and industrial trade groups included development of exemption rules and testimony before state regulatory groups. Exemptions involving the basic technical approach developed have now spread to more than a dozen states.



Led the laboratory and field trials to demonstrate that selected foundry wastes could be used as substitutes for low-permeability soils and topsoil for final cover as part of landfill closure (1979/1980).

This pioneering project set out to prove what many foundry managers knew from experience – that some foundries wastes – particularly excess system sand, dusts and

sludges from green sand molding processes could be used as effective substitutes for low permeability (silty/clayey) soils and topsoil for construction of the required final cover in foundry landfills. Acid and de-ionized water leaching tests were used to demonstrate the very low leaching potential of the mixtures. Next, standard soil tests were performed to guide the recipes for blending of the materials to most closely match the important characteristics of the soils. Then, greenhouse tests were used to test various waste mixtures for different types of vegetation. Finally, full-scale field plots were constructed to demonstrate success at full scale.

Direct Revegetation Test Plots

Several foundries have now employed these methods. The net savings calculated for the foundry that was the subject of the original study was $1.4 million in 1980 dollars for a 30 acre landfill.

RCRA Surface Impoundment Closures and Conceptual Design of Exempt Replacement Waste Water Treatment Tank System

Developed clean closure plans for surface impoundments for a chemical manufacturer, and led negotiation of closure approvals with state agency. The negotiation also eliminated a pending regulatory action to incorporate the plant's wastewater treatment and sludge de-watering facilities under RCRA jurisdiction. This action would have also created CERCLA liability at two county landfills, where the sludge had been disposed. Developed the conceptual design and process narrative for RCRA–exempt tanks to replace the surface impoundments. The design included an innovative rotating–function concept that provided essential redundancy while reducing maintenance costs.

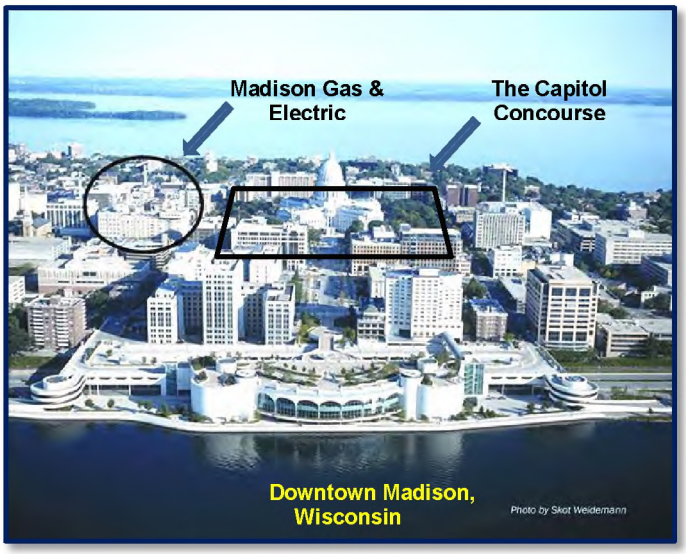
Three Tank Wastewater Treatment Facility at Specialty Chemical Plant that Manufactured the Material for the Space Shuttle Tiles

Process Optimization for Coal-Fired Power Generation Facility

Led coal handling process optimization team session for Madison Gas and Electric Company (MG&E) to optimize coal handling and meet stringent air pollution standards. The facility is located in downtown Madison, Wisconsin, and is just six blocks from the state capitol building and three blocks from the Department of Natural Resources – the state's environmental regulatory agency. The team session lasted two full days and MG&E participants included representatives from engineering, operations, maintenance, procurement, finance, and organized labor. Kestrel retained two power industry experts – one in materials handling and one in combustion.

These experts retained by Kestrel were included to provide technical support to the company team.

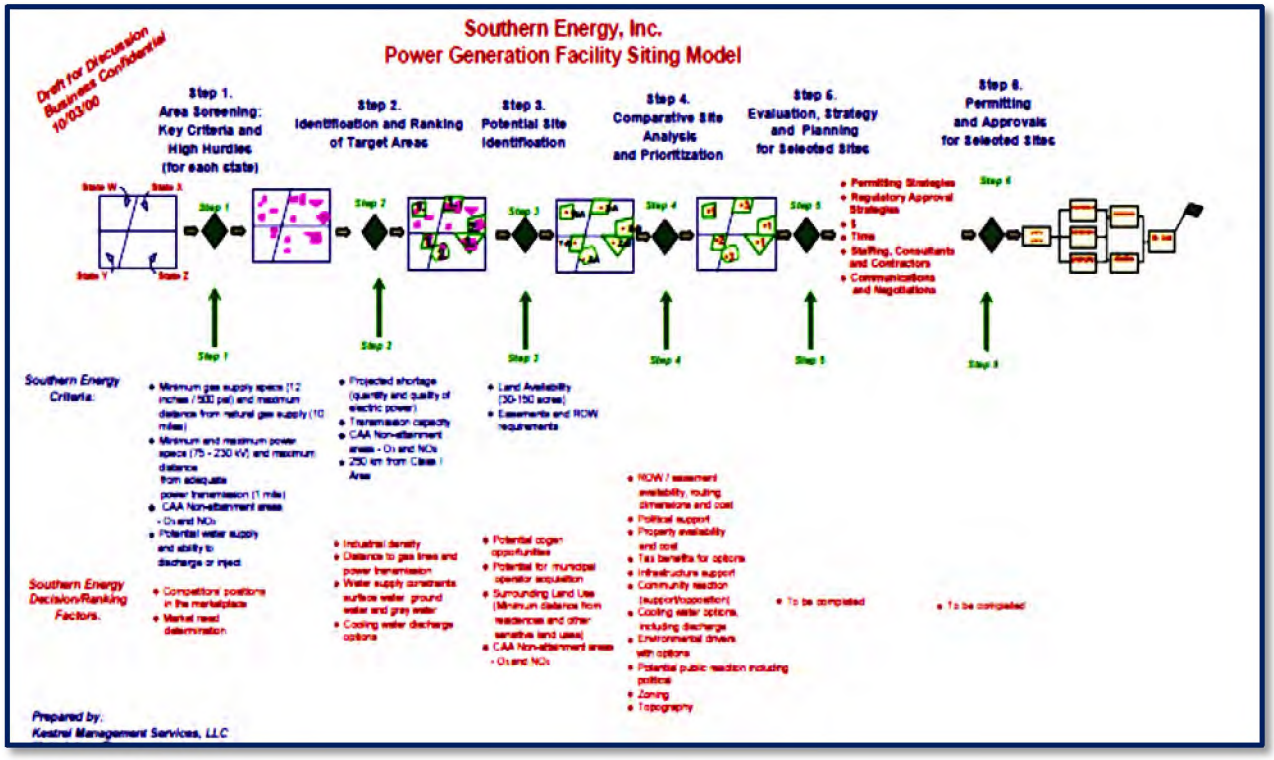
The result was that the lead operator of the coal yard came up with the optimum solution after listening for nearly four hours. The lead operator was a 28 year employee and a union member. The net savings produced totaled $5.3 million, and the solution was a major improvement over the solution that had been proposed previously and was on-the-table. The experts worked all night to draw up the lead operator's solution – with several options and potential refinements.



By noon the second day, MG&E management had adopted the approach. A pending union strike was averted and the concept was refined, permitted, and implemented – saving the facility from likely shutdown.

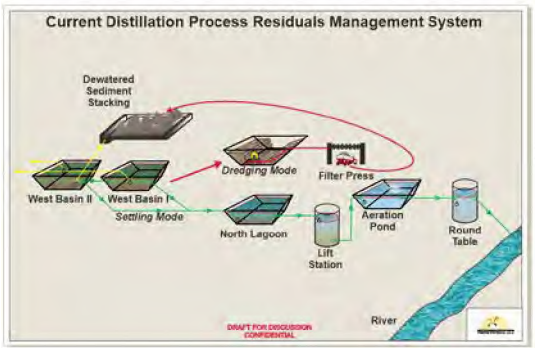
Site Selection Study for Mirant Corporation, the Merchant Power Affiliate of the Southern Company

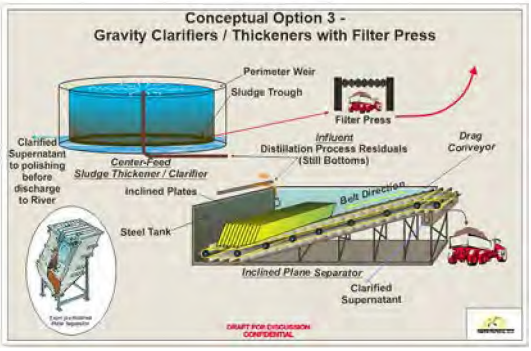
Led a Site Selection team for merchant gas-fired turbine peaking facilities employing GIS-based screening and ground-truthing for critical factors. Mirant selected two locations before the price of natural gas rose abruptly and the Enron scandal took a toll on the merchant power business. Mirant was subsequently closed.



Residuals Management Alternatives Analysis for a Nuclear Fuel Rod Manufacturing Facility

Led the development of a residuals management alternatives analysis, including a performance-based design/value engineering process for a nuclear fuel rod manufacturing facility. The alternatives analysis included identification of five absolutes and approximately forty considerations. The analysis included technical, economic, regulatory, safety, environmental, and market factors for management, recycling, materials substitution, process modification, reclamation, and marketing of several types of residuals.



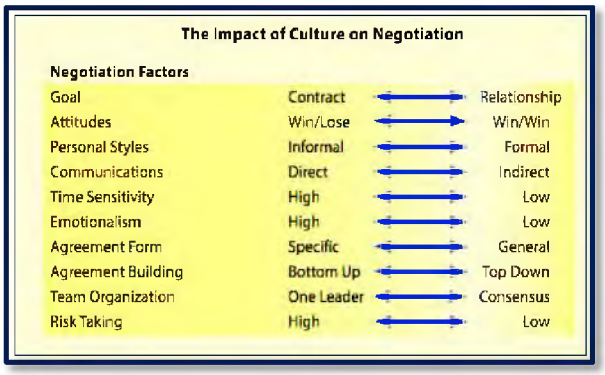


Conceptual Option 2 - Combined Solids Settling/Dewatering Tanks

Preliminary Opinion of Probable Cost Range

Item No.	Item Name	Description	Conceptual Design / Cost Basis	Preliminary Estimate of Quantities and Costs	Total Item Cost / Item Frequency	Timing of Payment	Uniform Annual Equivalent Cost at i = 10%
Construction							
C-1	Concrete Settling Dewatering Tank Construction				One Time		
C-1a	Initial Earthwork in Preparation for Concrete Structure	Import and place fill for subgrade and place as necessary to accommodate a 120' x 130' concrete settling/ dewatering tank system, separated into 3 units.	**Design Basis:** Install within existing West I basin. Import fill as needed	(a) Use 3000 cy of sand as subgrade within existing West I basin. 3000cy x $25.00/cy = $75,000 plus (b) 30% for design, construction management contingency = $22,500. Total Sum = $75,000 + $22,500. **Total Item Cost = $100,000**	$100,000 / One Time (Expected life = 25 years)		$11,000
C-1b	Base Layer of Crushed Stone	Furnish materials and labor to install a 4" layer of crushed stone as a base for the poured concrete.	**Design Basis:** See C-1c - Combined footprint of 3 tank units plus 2' all-around	(125 x 135 x 0.7 x 1.15) / 27 = 503 cy @ $25.00/cy for crushed stone, furnished and placed = $12,575. **Total Item Cost = $15,000.**	$15,000 / One Time (Expected life = 2 years)		$9,000
C-1c	Three Section Concrete Settling Tank Drying Bed	Furnish labor and materials to construct a 120' x 130' x 1' thick concrete settling/dewatering tank, separated into 3 units.	**Design Basis:** Volume of influent and required settling time determine required capacity by liquid volume for each tank unit. Assume 2 tanks settling while one drying. 1.5' freeboard on 3 sides.	See separate calculations on design and concrete quantities. (a) 900 cy x $250.00/cy in place unit price = $225,000 plus (b) 50% for design, construction management, contingency. = $112,500. Total Sum = 225,000 + 112,500 = $450,000. **Total Item Cost = $450,000**	$450,000 / One Time (Expected life = 25 years)		$50,000
C-1d	Header Piping / Drainage Piping Modifications	Furnish materials and labor to install header piping, valves, and nozzles to fill each of the three units; provide and install piping for drainage to clarifier / polishing pond.	**Design Basis:** For conceptual design, use 3" stainless steel pipe, fittings and valves for distribution headers, 6" HDPE for effluent from tanks to existing polishing ponds. **Cost Basis:** For conceptual design, use 15% of concrete construction costs.	use 15% of $450,000 = $67,500.00. **Total Item Cost = $70,000.**	$70,000 / One Time (Expected life = 15 years)		$9,000
C-1e	Appurtenances	Furnish and install Geonet drainage grate, deck plates, washed stone for drainage layer	**Design Basis:** Geonet based on particle size, deck plates and grates based on vehicle weight. For conceptual design, use 5% of concrete construction costs.	Use 5% of $450,000 = $22,500. **Total Item Cost = $25,000.**	$25,000 / One Time (Expected life = 10 years)		$4,000

Contract Dispute Involving Environmental Impairment for a Manufacturing Company



Served as technical consultant expert in a dispute between a manufacturing company and a design-build contractor involving groundwater contamination attributed to deficiencies in design and construction of a solvent recovery system. Analysis of design, construction and operations records showed that the spill containment and storm water management did not comply with regulations and design standards in place at the time of construction, allowing chlorinated solvents to be released to the ground.

This release resulted in wide distribution to bedrock of chlorinated solvents in dense non-aqueous phase liquid (DNAPL) phase. With studies and remediation estimated at nearly $20 million, establishing responsibility for the cause of the release is critical. The Design-Build contractor and its insurance company have come forward to discuss their responsibility on the basis of the analysis provided by Kestrel. The financial aspects of responsibility will apparently be resolved through negotiation, with no litigation required.

Sangamo Weston NPL Site OU1 (Plant Site and Remote Disposal Sites) and OU2 (Twelve Mile River and Lake Hartwell), Pickens, South Carolina

The facility manufactured electrical capacitors, including power factor capacitors that were filled with a PCB dielectric fluid. Prior to 1977 the spent dielectric fluids were either discharged as part of the wastewater effluent to a Town Creek, or drummed and disposed in one of several on-site landfills.

Trichloroethene and tetrachloroethene were co-disposed with PCBs in the same disposal areas. Also, a large number of off-specification capacitors were disposed in the same landfills. In addition to the on-site disposal areas seven off-site disposal sites were identified; each contained similar waste materials.

The former manufacturing facility and the seven off-site disposal areas make up OU1 of this CERCLA NPL site. This CERCLA NPL site has seven major disposal areas of PCBs in soils and waste and VOCs in ground water. OU2 includes Town Creek, Twelve Mile Creek/River, and 1/3 of Lake Hartwell. Fish advisories have been in place for nearly three decades, and Twelve Mile River is the focus of major dam removal and river restoration efforts.

- Served as senior consultant for the RI/FS/RD and groundwater RA, which included soil vapor extraction, and limited pumping and treatment for VOC's.
- Served as senior consultant for the CERCLA 106 Emergency Removal Action on the plant site and a remote disposal site. (1987-1990)
- Served as senior consultant on the FS, including the Treatability Study. (1988-1991)

Twelve Mile River Dam Removal and Restoration Project, South Carolina

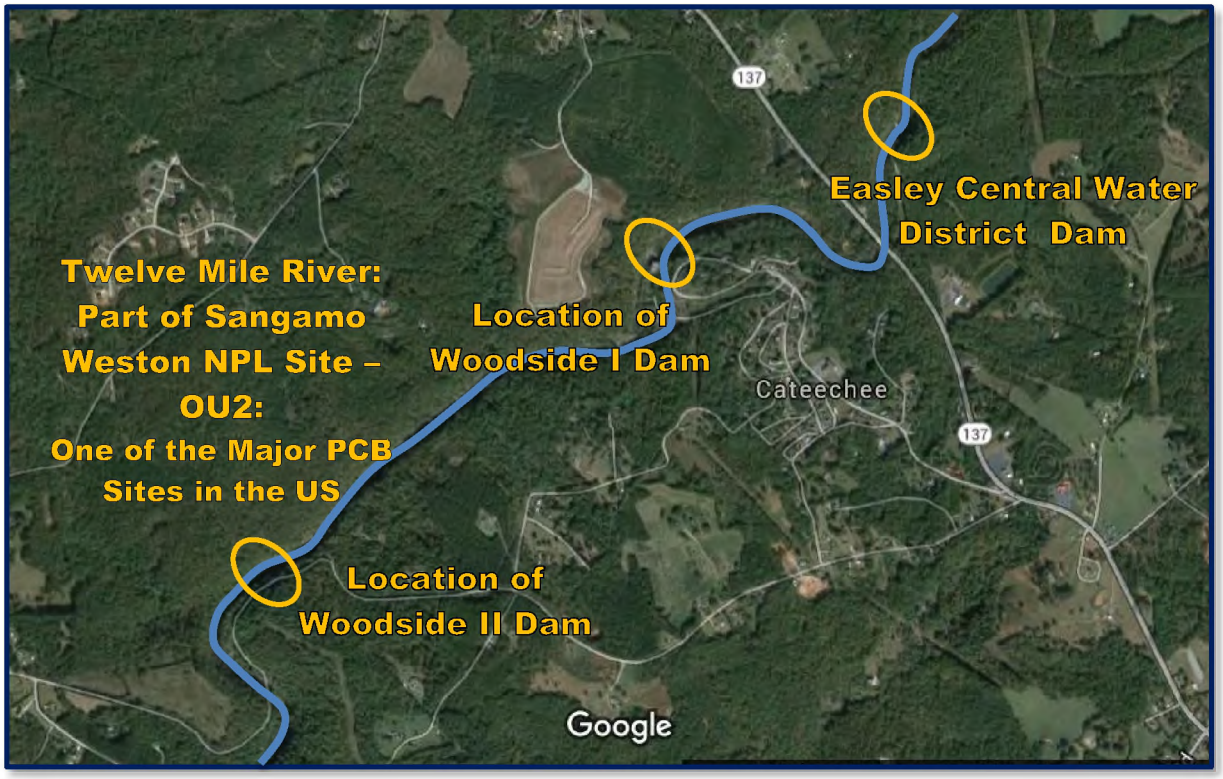
Sangamo Weston manufactured a range of capacitors which were filled with PCB-impregnated media and with PCB fluids. Twelve Mile River receives water from Town Creek, which was the stream to which Sangamo Weston discharged process wastewaters. The facility discharged an estimated 400,000 lbs. of PCB to the stream, which ended up in the sediments behind three dams in the lower reaches of Twelve Mile River and in the upper one third of Lake Hartwell.

As part of a settlement with the Natural Resource Trustee Council for the water resources, Schlumberger Technology Corp., the successor to Sangamo Weston, paid a penalty in excess of $13 million and agreed to purchase and remove the lower two dams, and to restore 1.5 miles of impounded river to natural, pre-dam conditions. The Consent Decree between Schlumberger and the Natural Resource Trustees provided that the Natural Resource Trustees pursue, in good faith, an

effort to remove the Easley Central Water District Dam and to restore that final, upper reach of the river impoundments.

For Schlumberger, I led Kestrel Horizons' services, as follows:

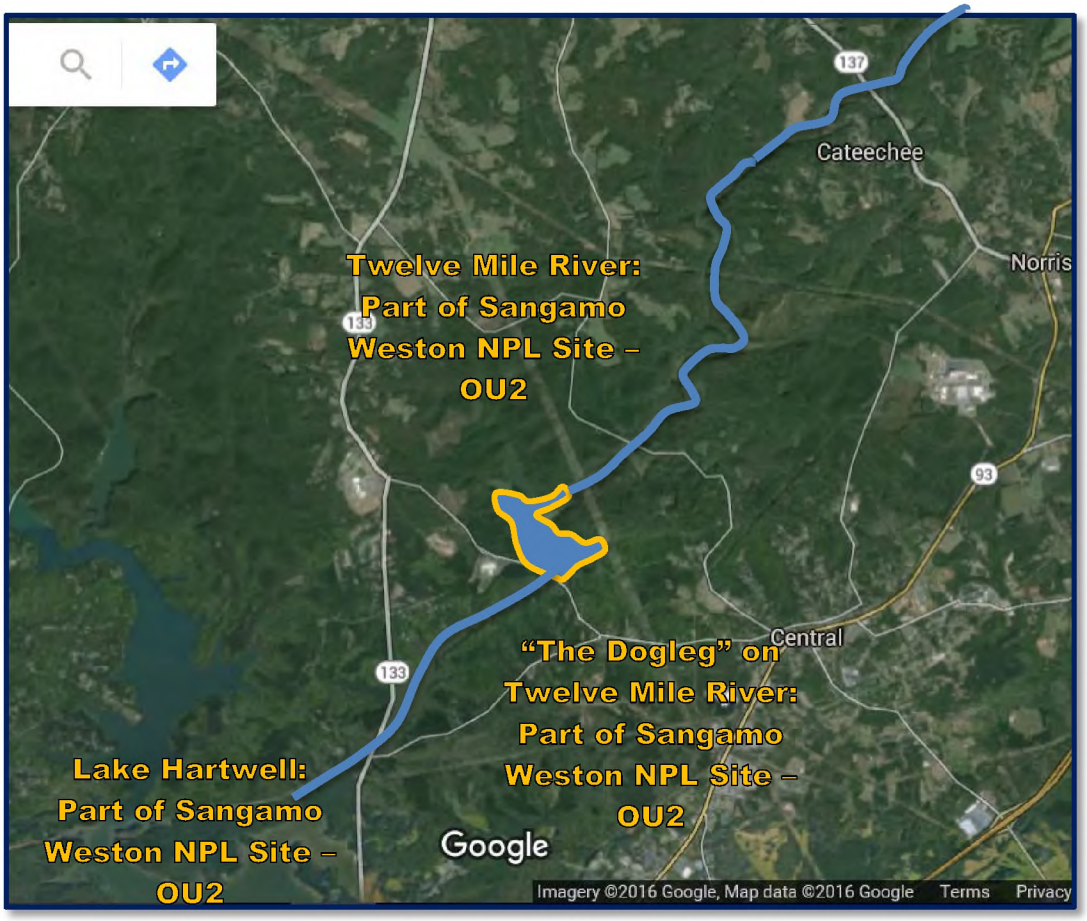
- Negotiated with and managed consultants and contractors for detailed engineering and construction of the project.
- In conjunction with legal counsel, developed regulatory strategies for important matters involving removal and disposition of sediment, management of supernatant from hydraulic dredging, potential constructive use of dredged sediment, and stream restoration.
- Performed bedrock mapping and sediment analysis for nearly one mile of river channel.
- Negotiated agreements with 22 property owners who own land to the middle of Twelve Mile River, including access and ownership of sediments.
- Developed a conceptual alternatives analysis for the project, including alternative conceptual engineering designs, regulatory analyses, and cost estimates.
- Negotiated with potential suppliers of key materials for river restoration.
- Developed estimates for contingent liabilities in conformance with the provisions of Sarbanes Oxley.
- Assisted with meetings involving state and federal regulatory agency staff.





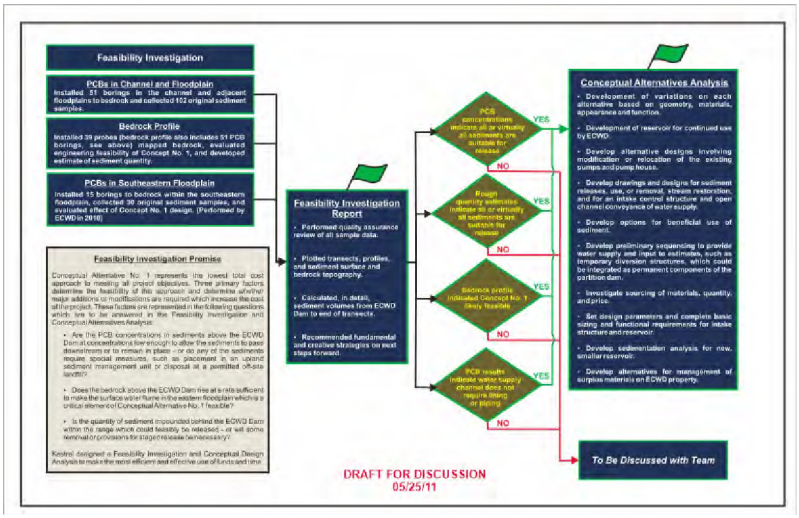




For Easley Central Water District and the Natural Resource Trustee Council, I led Kestrel Horizons' services, as follows:

- Performed detailed bedrock mapping and sediment analysis for channel and floodplains for 2,000 foot impoundment.
- Developed preliminary conceptual alternatives and opinions of probable costs for planning and public communications.
- Presented plans and results to Natural Resource Trustee Council, Federal Court Receivers, and other stakeholders.



Cateechee Rapids

Restoration/Construction Sequence

Fundamental Principles of Cateechee Rapids Restoration/Construction Project

- Restore TMC Cateechee reach to a more natural pre-dam condition.
- Manage adverse effects of restoration on the natural environment to an acceptable level during and after the restoration.
- Manage adverse effects of restoration on private properties to an acceptable level during and after restoration.
- Enable flow of sediments from upstream to pass downstream so that sediment blanket continues to build in downstream of Woodside II.

Cateechee Rapids

Restoration/Construction Sequence

Key Considerations in the Project Design

- Use natural forces rather than mechanical energy to accomplish restoration to the extent feasible.
- Use sustainable design and construction principles, including minimizing carbon footprint and beneficially using materials.
- Conduct restoration over sufficient time to enable natural stabilization to take effect.
- Provide reasonable access to restored creek by adjoining property owners.

Cateechee Rapids

Restoration/Construction Sequence

Key Considerations in the Project Design (continued)

- Identify and consider potential effects on private property owners of restoration
- Restore TMC in stages so that Trustees and stakeholders can witness results and agree on proceeding with or modifying the plan.
- Limit undermining of floodplain terraces such that slopes will not fail or terraces collapse unless this result is an intentional part of the plan and the property owner(s) are aware and accepting of the end result.

Cateechee Rapids

Restoration/Construction Sequence

Benefits of the Cateechee Rapids Approach

- Clean sediments are beneficially used to add to the sediment blanket downstream in Lake Hartwell.
- The approach allows the dam to be taken down in stages, creating very near-term results that address the most important goals of US EPA and the Natural Resource Trustees, which overlap – but include key differences.
- The approach, topped with rounded natural stone creates a natural look and rapid flowing water quickly – and consistently throughout the restoration process
- The restoration can be done at a pace that will ensure that the downstream effects are readily and soundly managed.
- The restoration can be done at a pace that protects adjoining private property and allows natural revegetation of the slopes and banks – and addition of revetments only as needed.

Cateechee Rapids

Restoration/Construction Sequence

Key Considerations in the Project Design (continued)

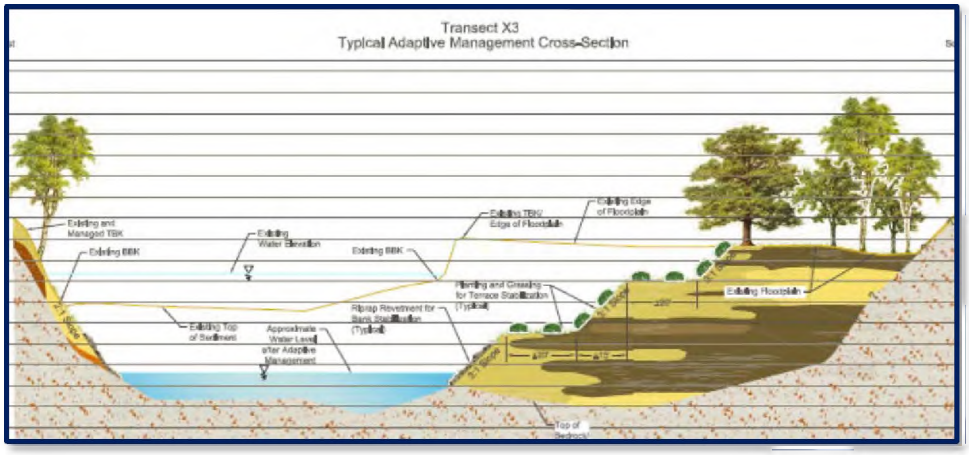
- Use rounded natural stone for surface revetments where natural appearance is most important. Use angular quarried stone where structural stability of revetment must be assured.
- If sediments are removed to facilitate restoration, potentially beneficially use some or all of sediments removed in a cost-effective, environmentally sound manner that complies with applicable regulations and manages Schlumberger's liability exposures.

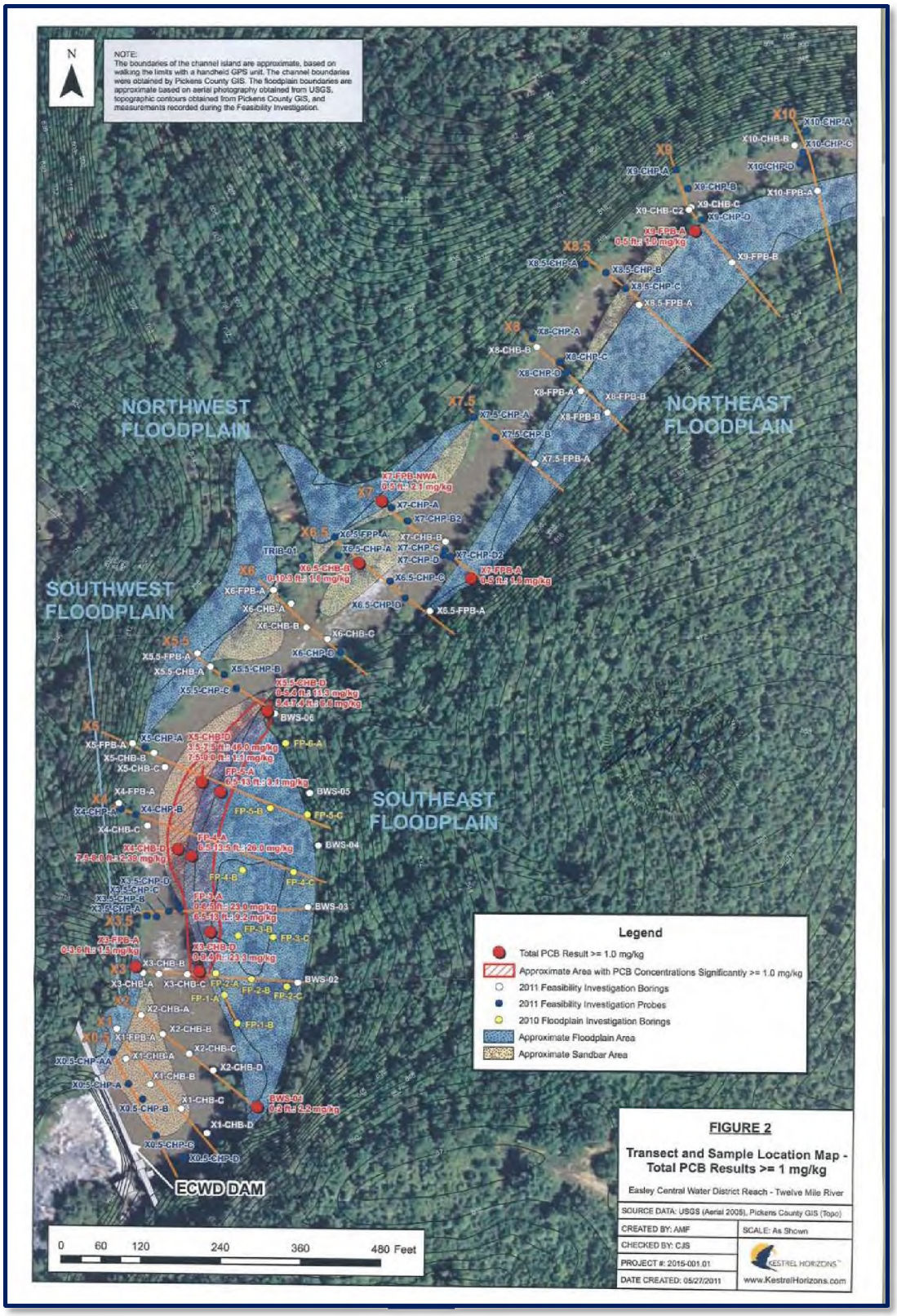
Cateechee Rapids

Restoration/Construction Sequence

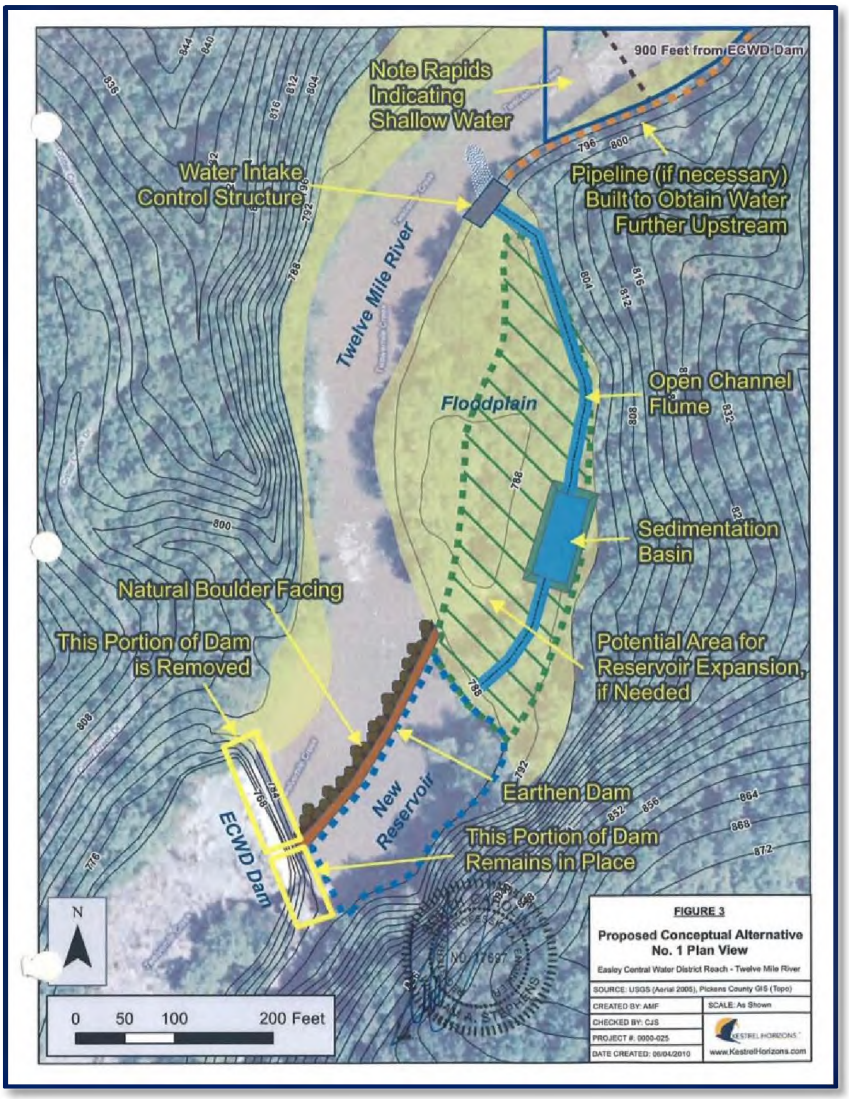
Benefits of the Cateechee Rapids Approach (continued)

- The dam remnants will serve to create stability for the rapids sections and will not be visible at the surface after the initial rapids construction is complete.
- If the Trustees and EPA choose, the restoration can be deemed complete at any stage of the plan. US EPA and the Trustees can get input of the stakeholders on the basis of the actual conditions in the field – not just engineering drawings and artists renderings.





Plan View of Soil and Sediment Sampling Program and PCB Results

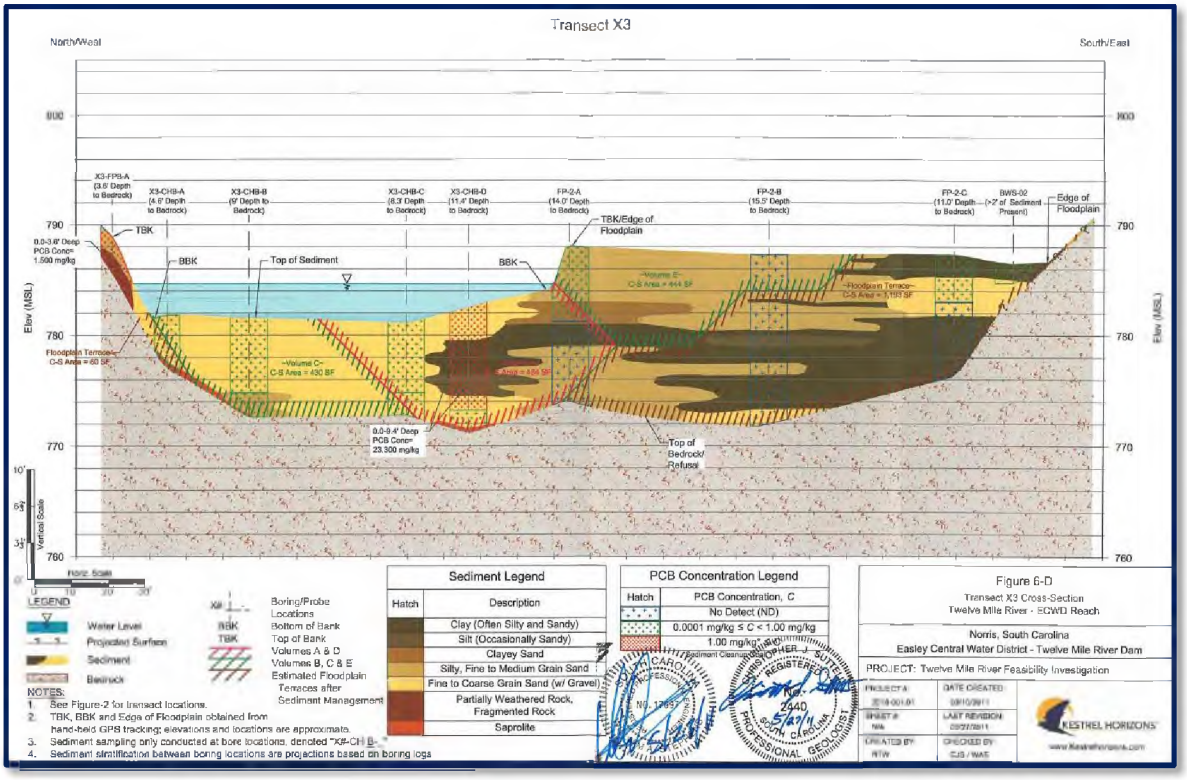


Plan View of Proposed Conceptual Alternative Number 1 for Providing Drinking Water Supply Reservoir While Allowing Free Flow of River

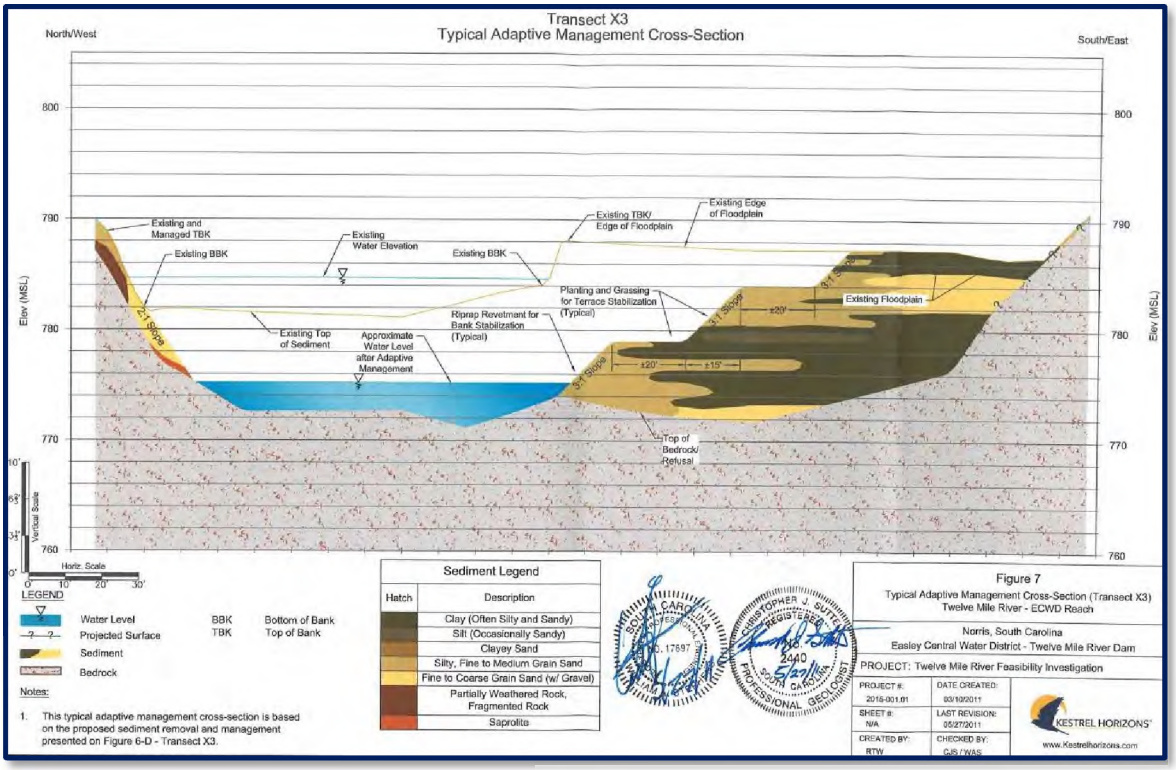
Easley Central Water District Dam on Twelve Mile River

Concepts for Kestrel Falls
Twelve Mile River at Easley Central Water District Dam

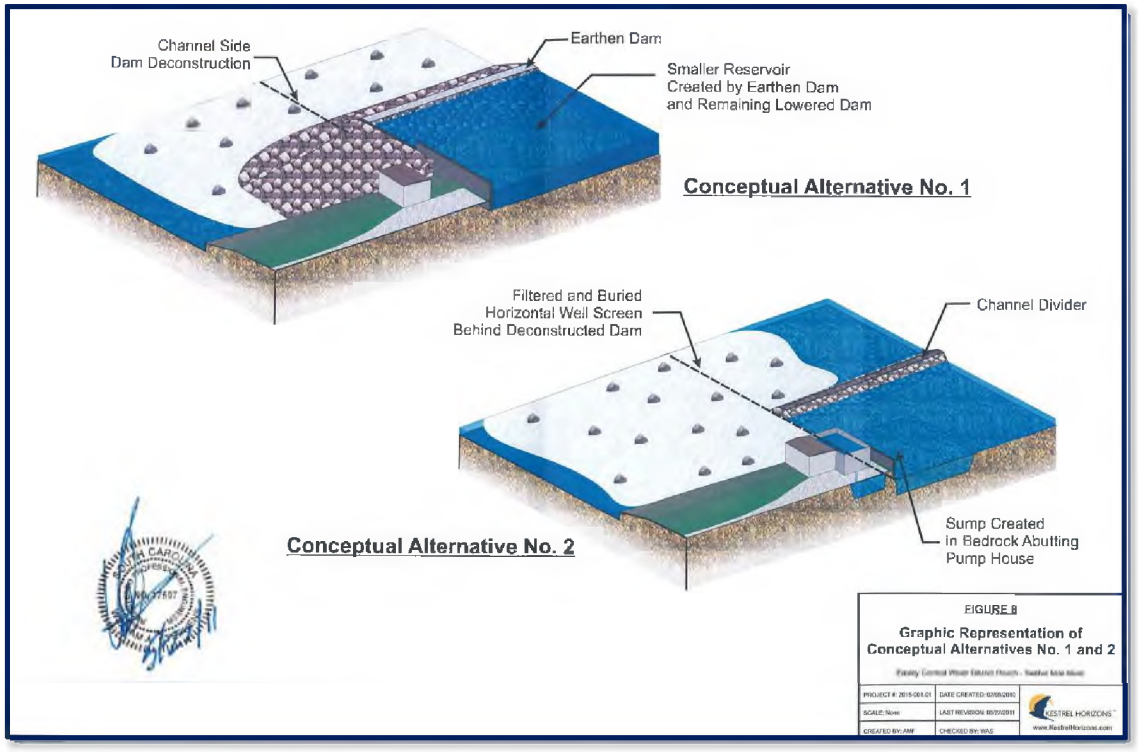
- Easley Central Water District Dam will remain.
- The downstream face of the dam will be buttressed with concrete and stone to insure structural integrity.
- The sluice gates will be replaced and designed to work with the Kestrel Falls design.
- The Kestrel Falls will completely obscure the dam structure, except tor the sluice gates at either end of the dam.
- The falls will be configured to prohibit the migration of undesirable species of fish upstream of the dam, namely carp and striped bass.
- The falls will be faced with natural stone from the area. These may include large stones from the TMR river bed between the dam and the Norris Highway.
- The Kestrel Falls design will be chosen from several candidate designs in a process mutually agreed to be the Natural Resource Trustee Council and the Easley Water District Board.
- The design must be approved by the ECWD Board.
- The ECWD's engineers will manage the design and construction of the sluice gates and the structural buttressing of the dam.
- Kestrel Horizons, LLC will manage the design and construction of the falls.
- The project will be entirely funded by proceeds from the TMR Natural Resource Damage settlement funds held by the Natural Resource Trustees.
- Pickens County will be deeded the land adjacent to the dam, plus the river bed above and below the dam, and will be responsible for public safety. The dam will remain under the ownership and control of the ECWD.



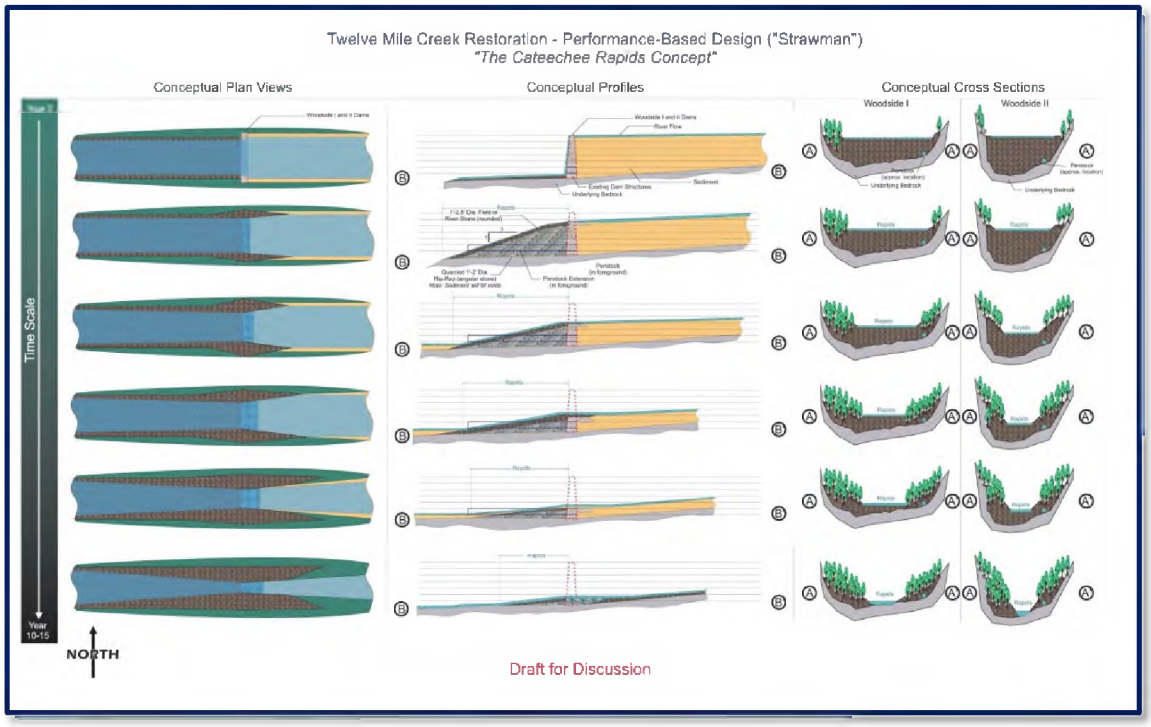
Transect of Twelve Mile River Depicting
Soil and Sediment Types and PCB Concentrations



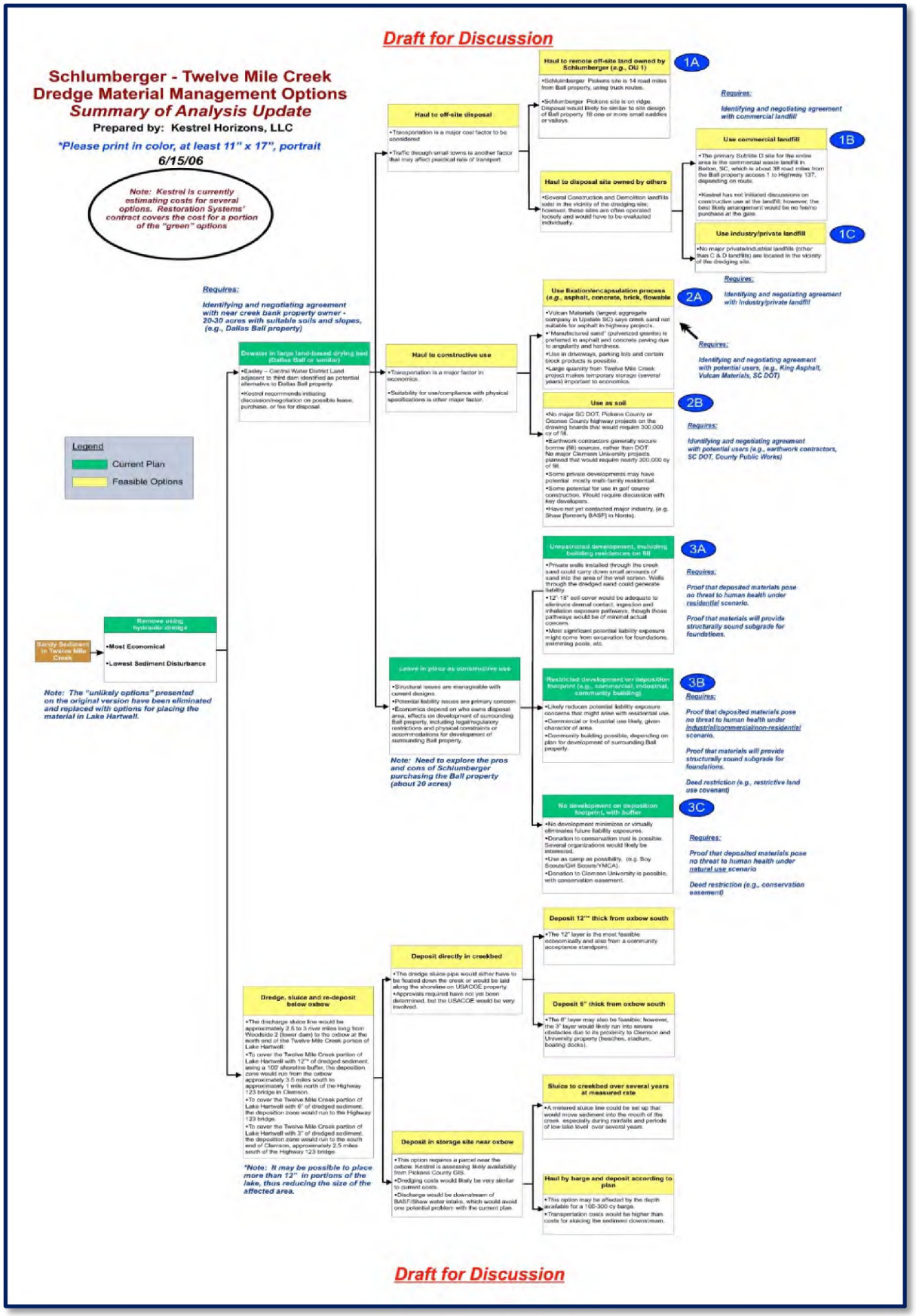
Transect of Twelve Mile River Depicting
Soil and Sediment Types and Proposed Earthwork



3D Rendition of Conceptual Alternatives 1 and 2



Conceptual Sequencing for Creation of Cateechee Rapids on Twelve Mile River



Dredge Material Management Options Analysis Diagram

Sluice Gates and Penstock Structure
Woodside I Dam

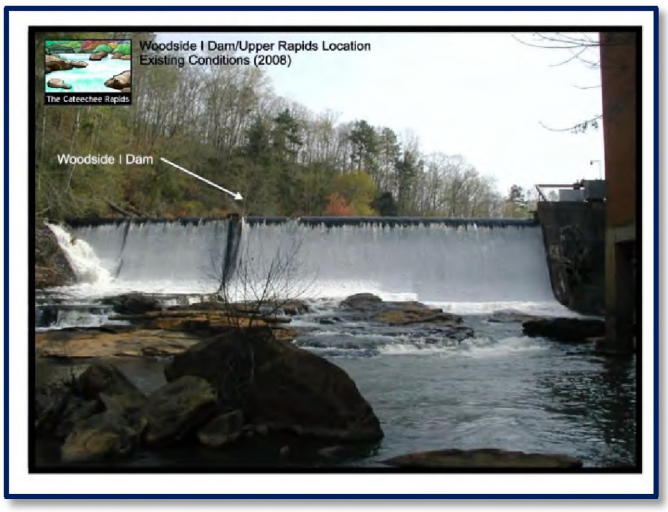


Photo Rendition of Creation of Rapids at Woodside I Dam Location

Photo Rendition of Creation of Rapids at Woodside I Dam Location

Photo Rendition of Creation of Rapids at Woodside I Dam Location

Photo Rendition of Creation of Rapids at Woodside II Dam Location

Photo Rendition of Creation of Rapids at Woodside II Dam Location

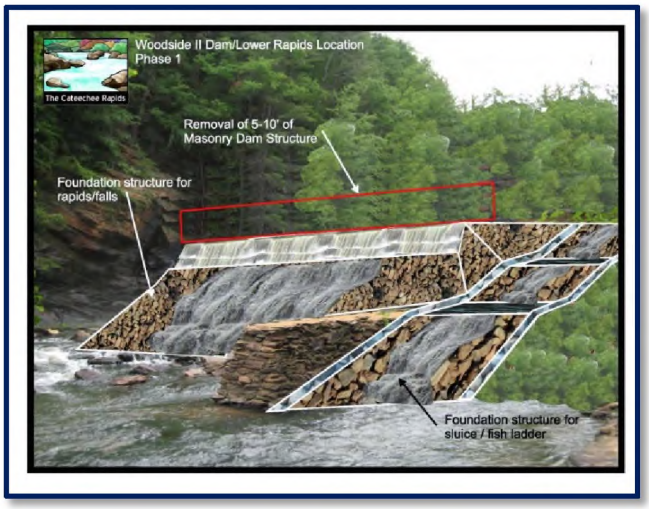


Photo Rendition of Creation of Rapids at Woodside II Dam Location

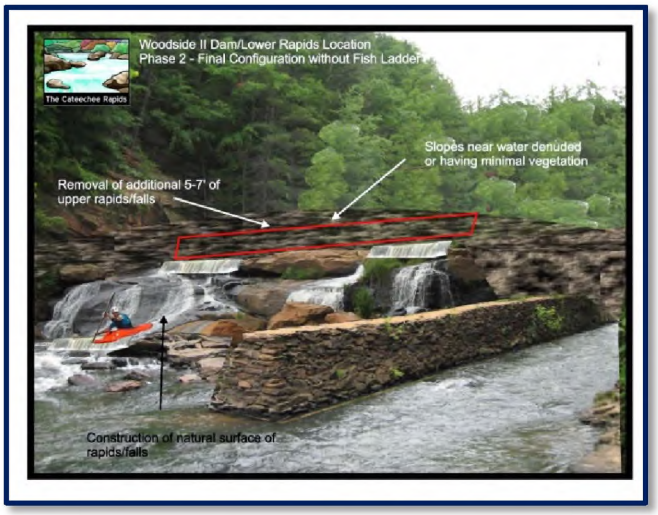


Photo Rendition of Creation of Rapids at Woodside II Dam Location

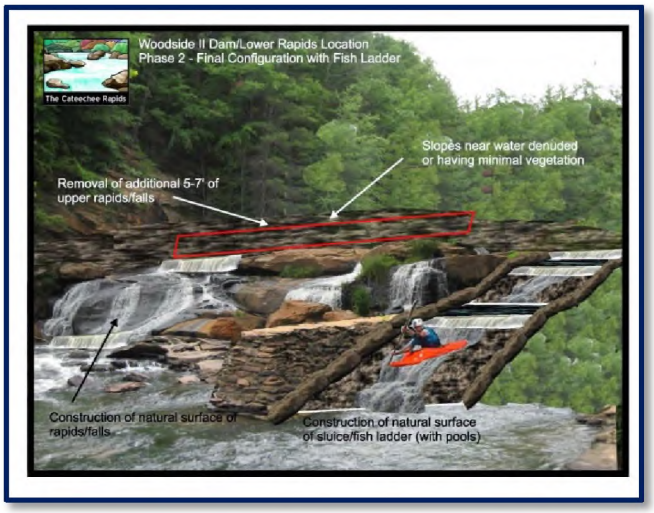
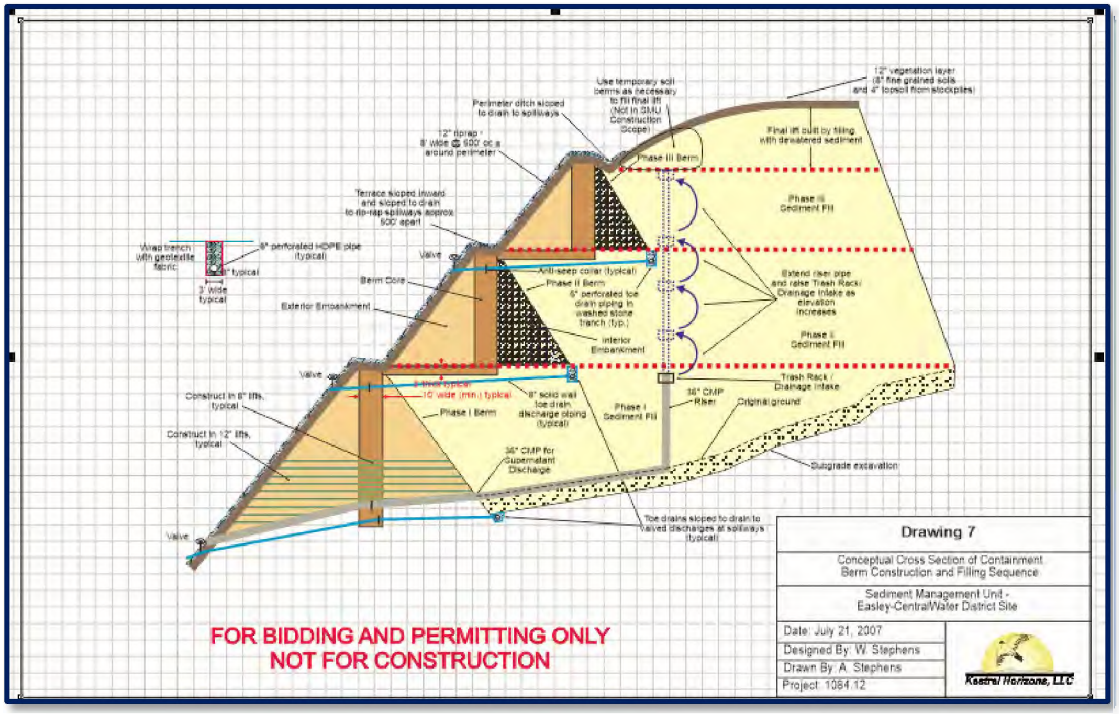
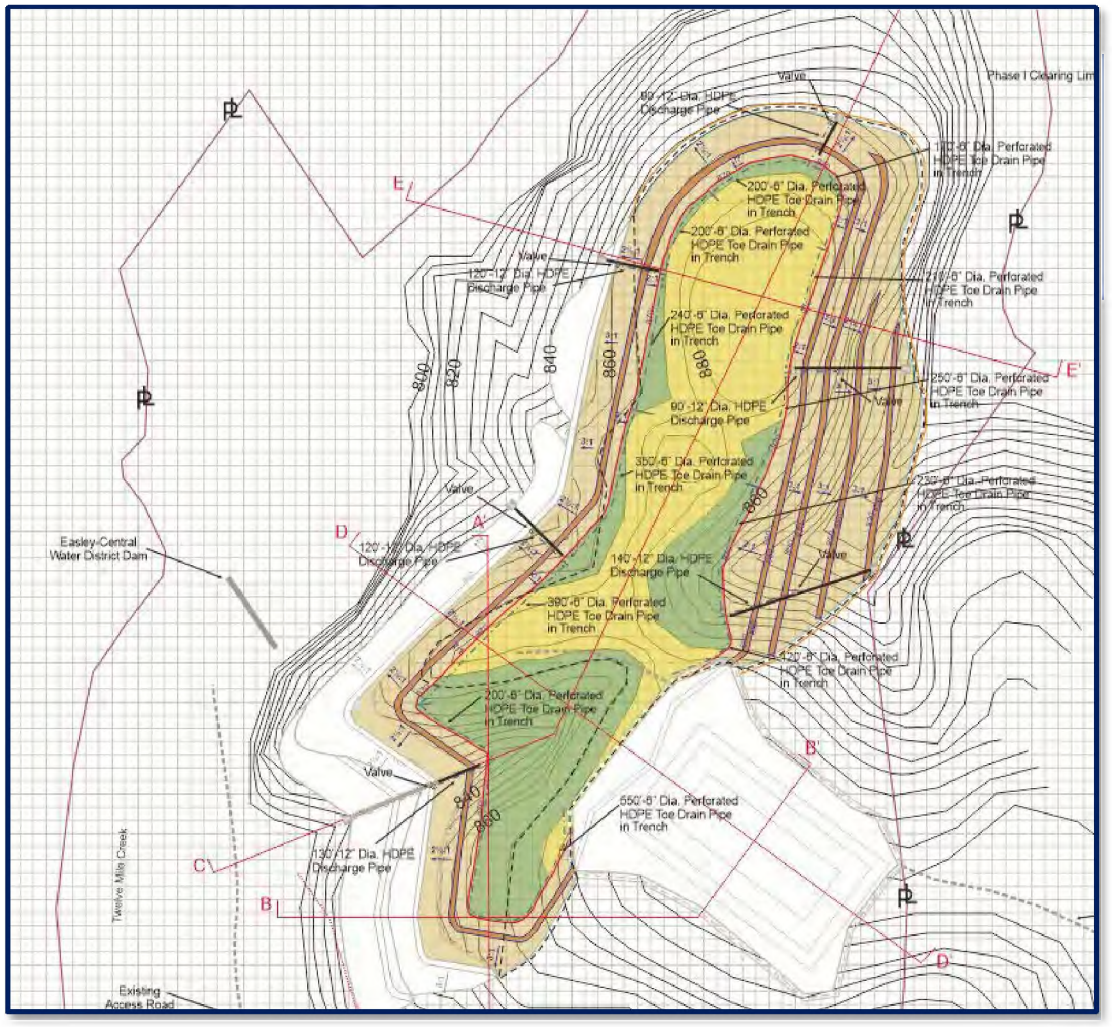


Photo Rendition of Creation of Rapids at Woodside II Dam Location


Drawing 7
Conceptual Cross Section of Containment Berm Construction and Filling Sequence
Sediment Management Unit - Easley-Central/Water District Site
Date: July 21, 2007
Designed By: W. Stephens
Drawn By: A. Stephens
Project: 1084.12
Kestrel Horizons, LLC
FOR BIDDING AND PERMITTING ONLY
NOT FOR CONSTRUCTION
Phase III Berm
Phase III Sediment Fill
Phase II Berm
Phase II Sediment Fill
Phase I Berm
Phase I Sediment Fill
Berm Core
Exterior Embankment
Interior Embankment
Trash Rack / Drainage Intake
36" CMP Riser
Original ground
Subgrade excavation
36" CMP for Supernatant Discharge
Valve
Toe drains sloped to drain to valved discharges at spillways (typical)


Easley-Central Water District Dam
Twelve Mile Creek
Existing Access Road
Phase I Clearing Limit
90'-12" Dia. HDPE Discharge Pipe
120'-12" Dia. HDPE Discharge Pipe
130'-12" Dia. HDPE Discharge Pipe
140'-12" Dia. HDPE Discharge Pipe
170'-6" Dia. Perforated HDPE Toe Drain Pipe in Trench
200'-6" Dia. Perforated HDPE Toe Drain Pipe in Trench
210'-6" Dia. Perforated HDPE Toe Drain Pipe in Trench
240'-6" Dia. Perforated HDPE Toe Drain Pipe in Trench
250'-6" Dia. Perforated HDPE Toe Drain Pipe in Trench
350'-6" Dia. Perforated HDPE Toe Drain Pipe in Trench
390'-6" Dia. Perforated HDPE Toe Drain Pipe in Trench
420'-6" Dia. Perforated HDPE Toe Drain Pipe in Trench
550'-6" Dia. Perforated HDPE Toe Drain Pipe in Trench
Valve
A
A'
B
B'
C
C'
D
D'
E
E'
800
820
840
860
880

General Motors Corporation NPL Site (Plant Site), Massena, NY

This aluminum casting facility used PCB hydraulic fluid extensively. The site is bordered on three sides by the Mohawk nation and lies between the St. Lawrence River and the Raquette River. The manufacturing facility became a CERCLA NPL site in the early 1980's.

- Critiqued and revised the first RI Workplan prepared by an EPA contractor in 1984 for this NPL site. A major consulting firm had performed a $1 million investigation of PCB contamination at the site prior to its listing on the NPL. Demonstrated that the apparent contamination of groundwater at 80 feet was an artifact of improper well construction. This enabled the focus of the RI Workplan to be modified to address legitimate technical issues. (1984-1986)
- Served as Senior Consultant for the original RI. (1986-1988)
- Served as Senior Consultant and Project Manager on the Supplemental RI, and the original Feasibility Study (1986-1989).

Management and Technical Leadership of Hercules 009 Landfill NPL Site

Bill directed the Feasibility Study, treatability studies, groundwater modeling and Remedial Design for the Hercules 009 Landfill NPL Site in Brunswick, Georgia. The Hercules 009 Landfill involved nearly 100,000 cubic yards of sludge from toxaphene manufacturing and affected soils. Most of the sludges and affected soils were below the water table, and in a sandy coastal environment.

Toxaphene concentrations in buried sludges were as high as two percent. Bill led the technical effort and regulatory negotiations to secure an approval for *in situ* treatment of selected materials with Monitored Natural Attenuation of groundwater. This solution saved more than 20 million dollars in comparison to the low temperature thermal desorption / off site incineration remedy initially preferred by US EPA.

Transformer Manufacturer Plant Site, Arkansas

During the manufacturing of electrical transformers, the company disposed of used transformer fluids, some of which contained PCBs, in several on-site ponds which were part of a former sawmill operation. Ultimately, the ponds were closed by backfilling with soil and capping with asphalt and concrete. Expansions to the plant facility were built directly over the old ponds. Fluids migrated from the ponds through cracks in the asphalt and concrete; additional capping did not prevent the release of the transformer fluids.

- Developed options for closure and a regulatory strategy. Led limited investigations to determine existing conditions to aid in the preparation of closure strategies. Developed a closure strategy and successfully negotiated with the state regulatory agency.

Capacitor Manufacturing Company – South Carolina

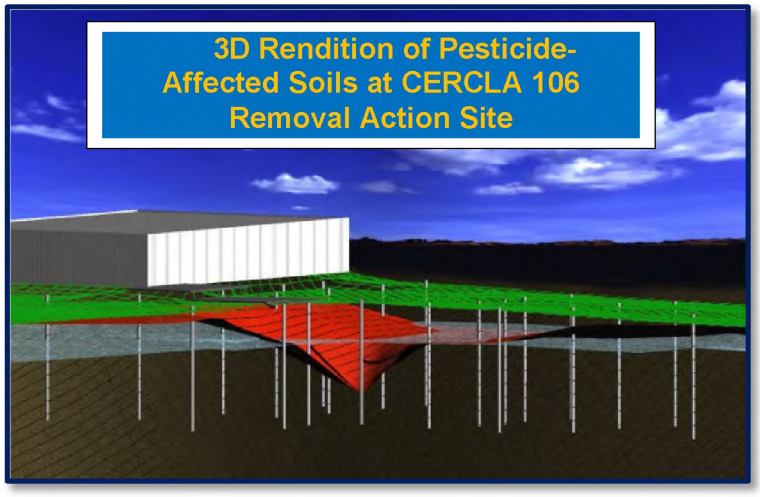
A PCB capacitor manufacturing facility was being purchased by Kestrel's client. The primary areas of environmental concern were old burial areas, runoff from an area under one of the production buildings, and the wastewater treatment system.

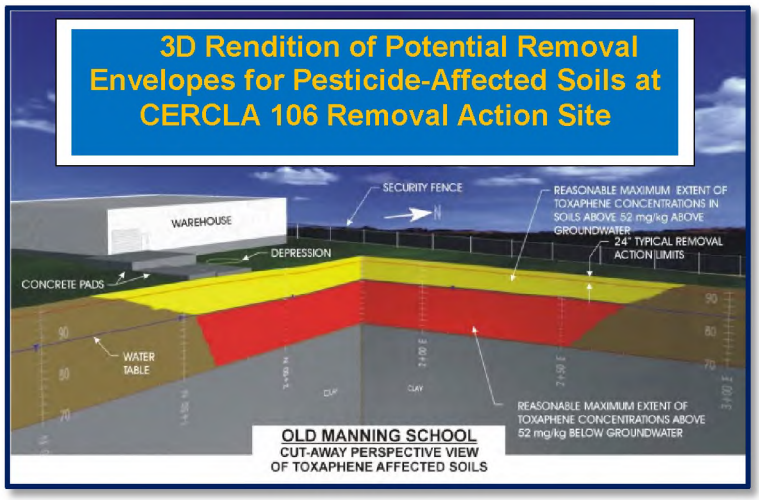
- Provided a defensible due diligence acquisition audit for the purchaser.
  - Quantified the potential liability as part of the purchase negotiation.

- Developed a sampling protocol to fill in critical data gaps.
- Provided a preliminary estimate of facility closure costs for the purchaser, who was purchasing the active facility to acquire market share and transfer manufacturing to another company facility.

Management of CERCLA 106 Removal Action at Pesticide Blending Facility

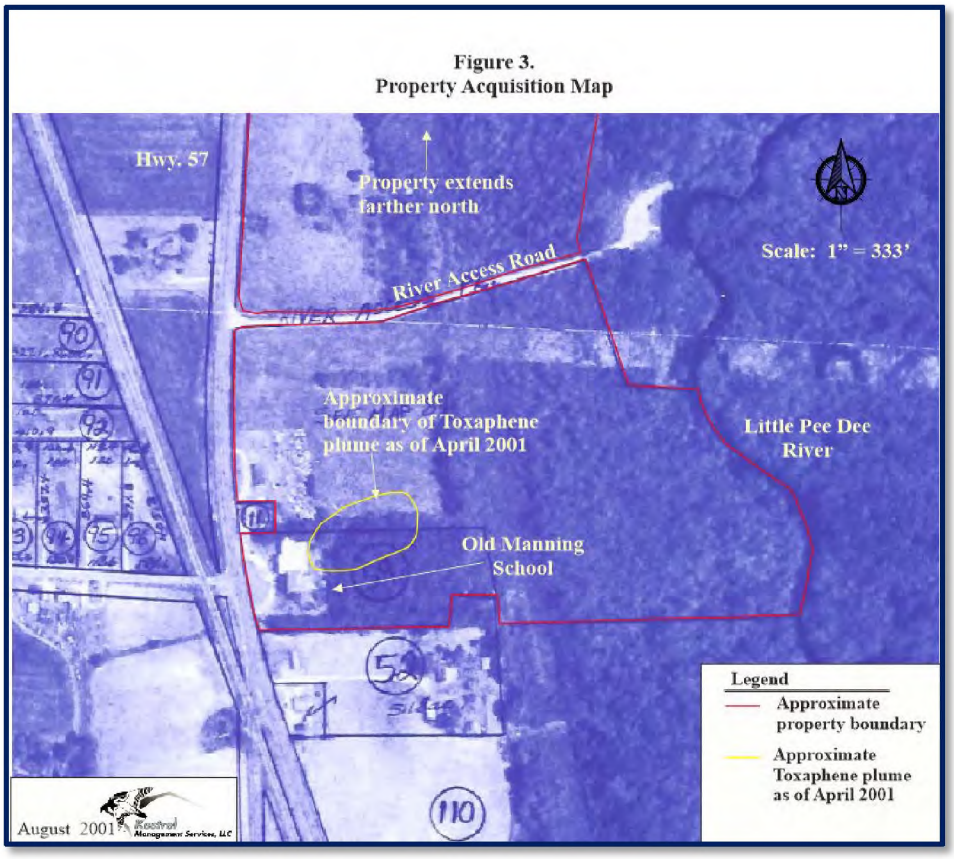
Led a Removal Action under Section 106 of CERCLA at a pesticide blending facility that had previously been the site of an elementary school. The Removal Action was limited to approximately 30% of the extent originally required by the technical staff of USEPA and the state agency. The spread of toxaphene and other pesticides had been substantially increased by the presence of xylene and other organic solvents in the soils and groundwater. The combination of limited groundwater monitoring, technical research, and modeling were used to demonstrate that xylene and other organic solvents were degrading, and that the spread of toxaphene and other pesticides would be limited. Assisted in acquiring neighboring property, providing the opportunity for the plume to attenuate before reaching a major surface water body several hundred yards away. Total savings in the CERCLA 106 Removal Action exceeded $3.5 million.



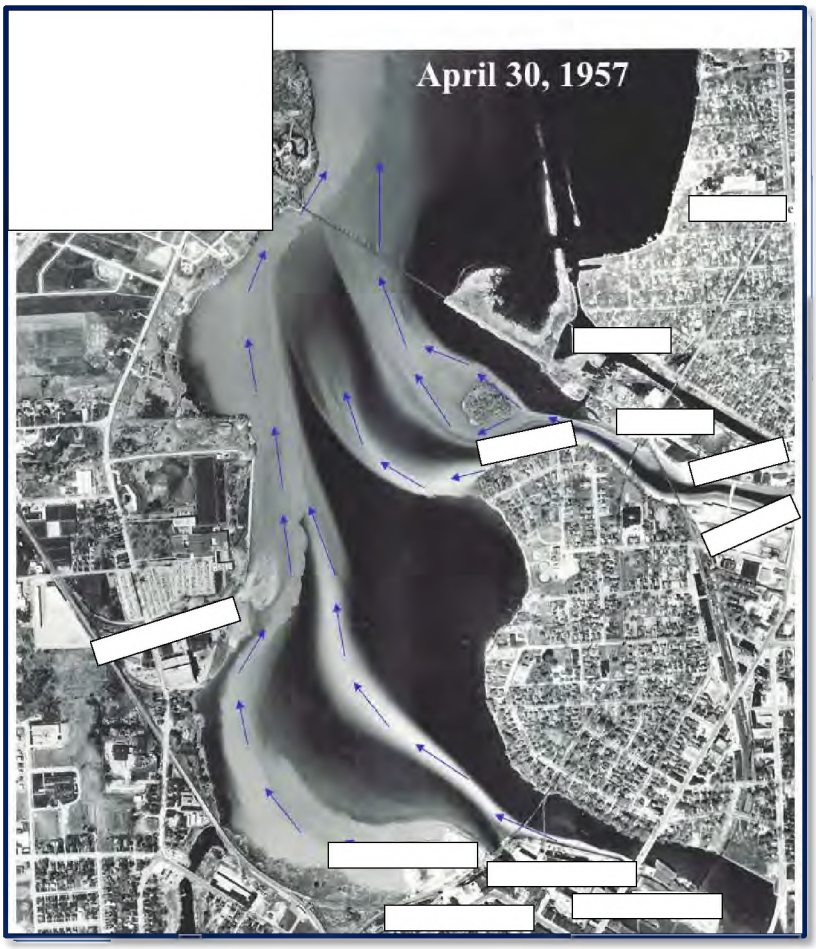


Surgical Removal of Pesticide-Affected Soils Using Statistical Interpretations of Data

Replacement of Pesticide-Affected Soils – No Testing Required by US EPA



Forensic Analysis of Bathymetry and Sediment Transport in Contaminated River Sediments



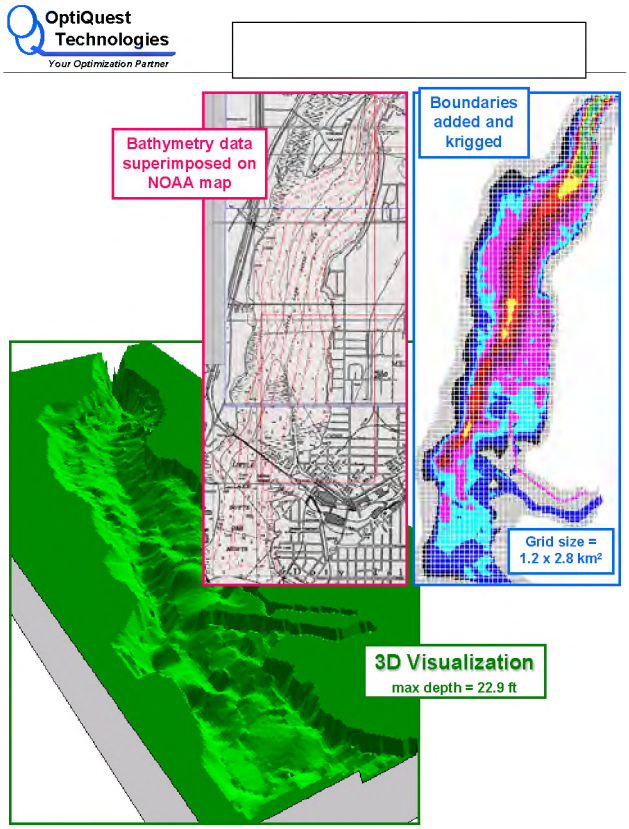
This site involves a large lake and many miles of river to which water containing PCBs was discharged by numerous entities. The relative contribution of Potentially Responsible Parties (PRPs), the distribution and stability of PCB-containing sediments, and the likely post-dredging conditions and sediment dynamics were major issues among the PRPs and between the PRP group and the regulatory agencies. The services were performed for an individual PRP to aid in strategy and positioning.

Basic Flow Tracing of Contributions of Various Potential Sources - 1957

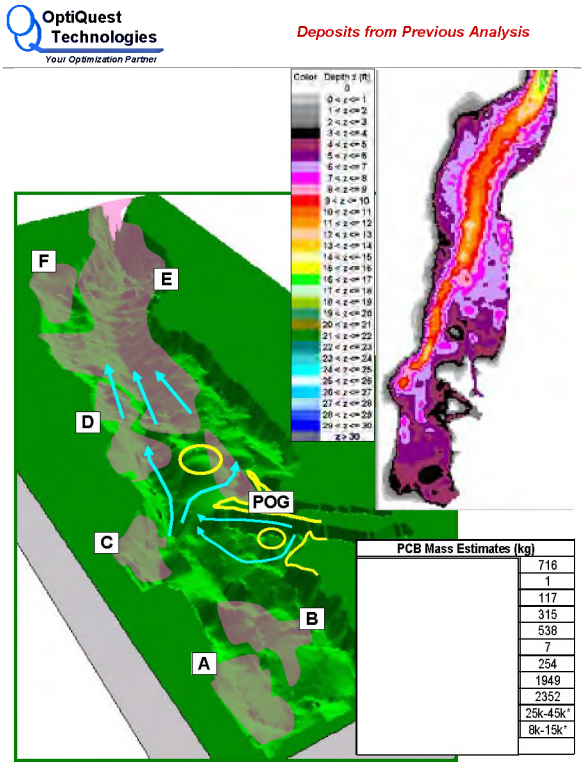
- Led a forensic analysis of bathymetry and sediment transport in contaminated river sediments.
- Searched government and institutional records, including Army Corps of Engineer and National Oceanic and Atmospheric Association documents, to identify bathymetric surveys and design and operational data on dams and locks for a segment of river affected by industrial and municipal discharges of PCBs and other constituents.
- Worked with a systems modeling consultant employing data mining to create a hydro-dynamic model capable of identifying historical contributions and predicting the effects of dredging and other potential remedial measures on sediment quality and future deposition and erosion of sediments.

The hydro-dynamic model showed greater than a 99% correlation to historical data, and was able to "predict" a major scouring of a portion of the river channel during historical flooding.

The extensive bathymetric surveys were correlated by establishing a common datum and accounting for the different methods used which ranged from conventional "polling" and plum line measurement to more sophisticated (but not necessarily more accurate) modern sonar methods. With historical bathymetry incorporated into the hydro-dynamic model, the model was able to predict that an area of the river basin currently identified as a major sediment trap as part of the remedy design, could become a major source area for re-suspension of sediments unless appropriate changes are made in the flow control systems and cross section of the river. These subtle nuances are not apparent in expensive deterministic models which relied only on the most current bathymetric survey performed using sonar.



Examples of 3D Modeling of Bathymetry



Examples of 3D Modeling of Bathymetry – PCB Correlations

Pheasant Branch Creek and Marina

Assisted in bathymetric survey and performed construction inspection of 40,000 cubic yard hydraulic dredging process to create a marina in Middleton, Wisconsin (1971). The project included filling land for commercial development, installation of sheet pile, and installation of rock gabions to stabilize eroded banks along the creek.

Hydraulic Dredge and Piping Similar to the Ones Used on Pheasant Branch Creek

Installation of Gabions Similar to the Ones Used on Pheasant Branch Creek

Sheet Pile Staged for Installation at Original Detyens Shipyards

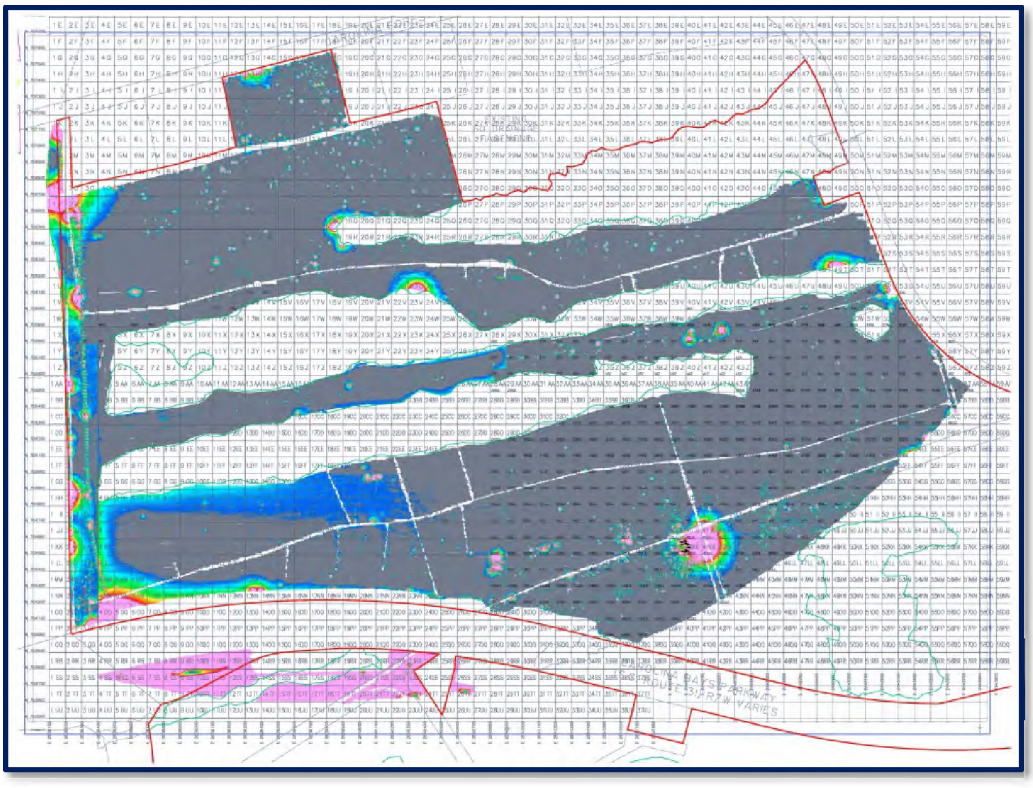
Managed project to remove buildings and other structures, make constructive use of blast media, and install sheet pile along the saltwater creek boundary of the original Detyens Shipyards.

Redevelopment – Land Bank – Conway Bombing and Gunnery Range

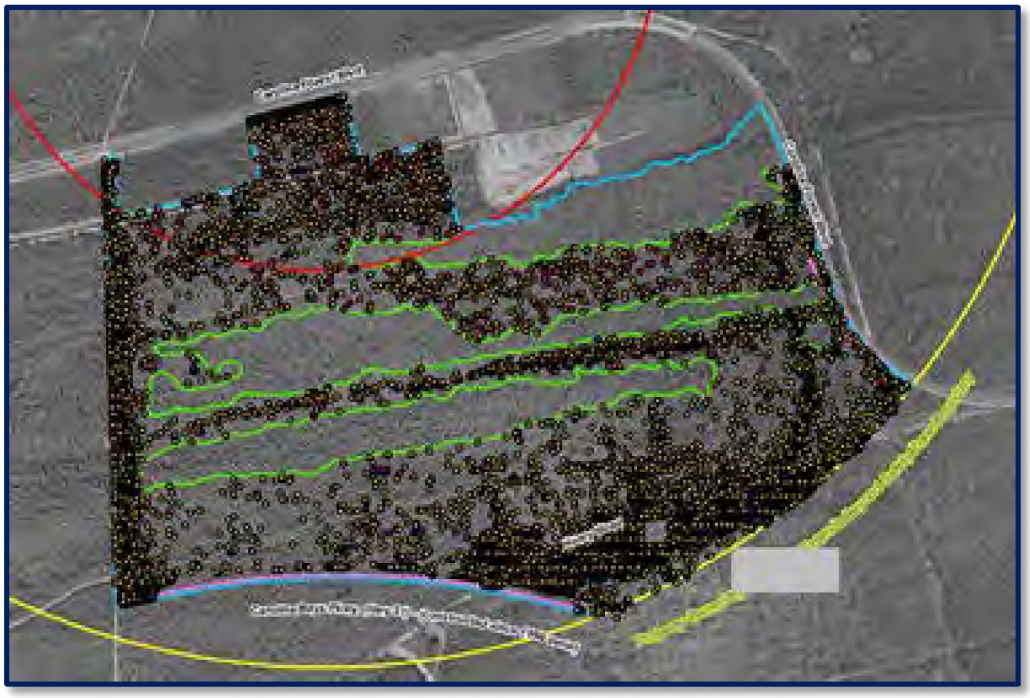
Technical Support for OE/UXO Investigation and Removal for Redevelopment of Former Bombing Range

Provided technical support for contractor management and determination of effectiveness of geophysical techniques in detecting ordnance at depth for large tracts of land in a coastal environment situated within or near the target zone of the bombing range.

The Land Bank Site – former Conway Bombing and Gunnery Practice Range for D Day Invasion – near Myrtle Beach, South Carolina



Maps Depicting Practice Debris and Unexploded Ordnance Clearance



Maps Depicting Practice Debris and Unexploded Ordnance Clearance

Land Development Earthwork after Clearance to Six Foot Depth

Example Practice Bombs and Debris Recovered

Macalloy: The Last Operating Manufacturing Plant Producing Ferrochromium Alloy

The last operating manufacturing plant producing ferrochromium alloy - the base for stainless steel – closed in the late 1990's. The facility was located on shipyard Creek in North Charleston, South Carolina – across the tidal creek from the Charleston Navy Base, which had also closed.

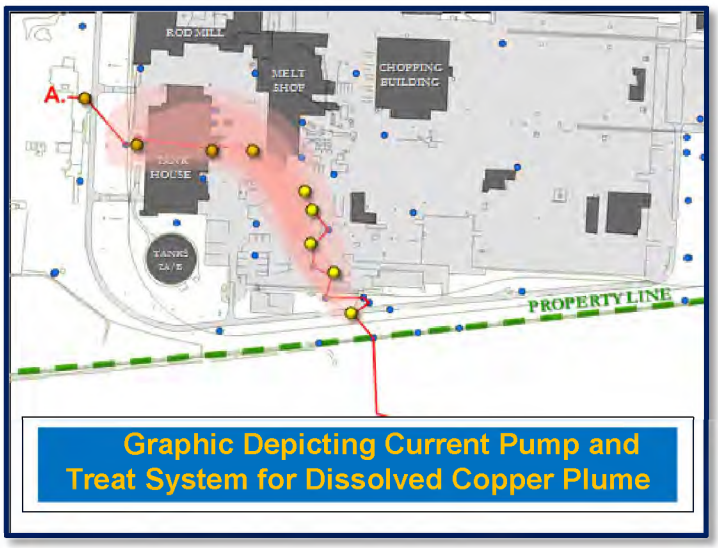
The US EPA proposed a fine of $200 million for alleged violations of environmental regulations – mostly storm water discharge and hazardous waste management regulations. The South Carolina Department of Health and Environmental Control had instituted a shellfish harvesting ban and consumption warning near the facility based on concern over hexavalent chromium releases.

The Macalloy Ferrochromium Manufacturing Facility from Shipyard Creek

Assisted legal counsel with analysis of alleged hazardous waste violations and provided the technical basis for a full defense. Performed demolition procurement assistance and preliminary demolition plan.

The Macalloy Ferrochromium Manufacturing Facility with Shipyard Creek and the Charleston Naval Base Beyond

Groundwater Remediation at Secondary Copper Smelting Facility



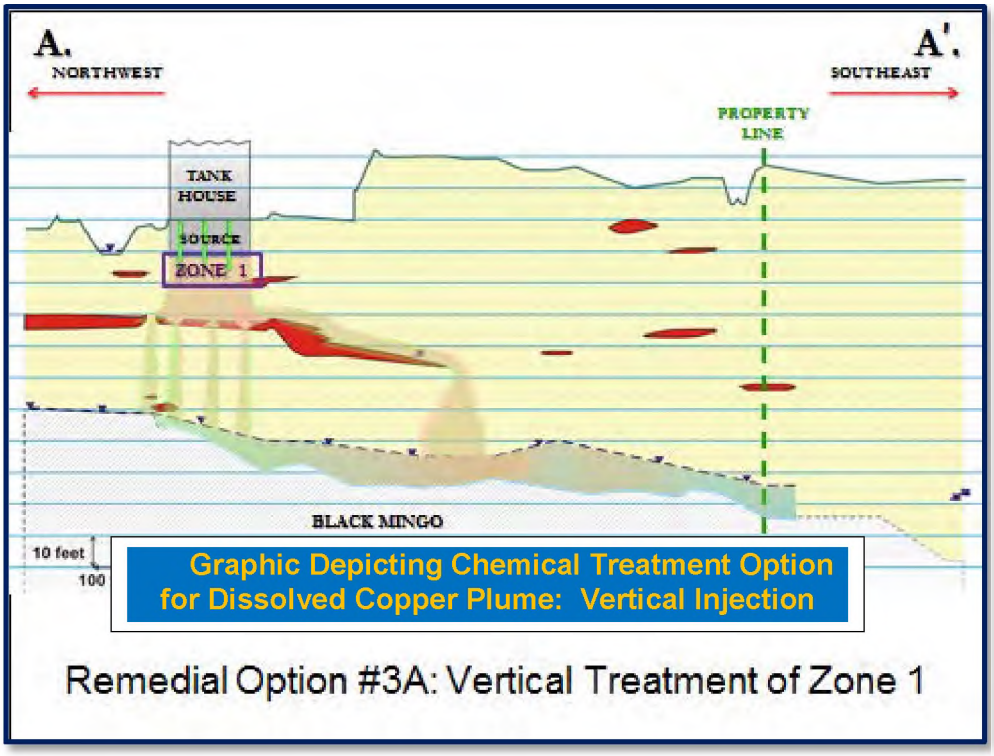
Graphic Depicting Current Pump and Treat System for Dissolved Copper Plume

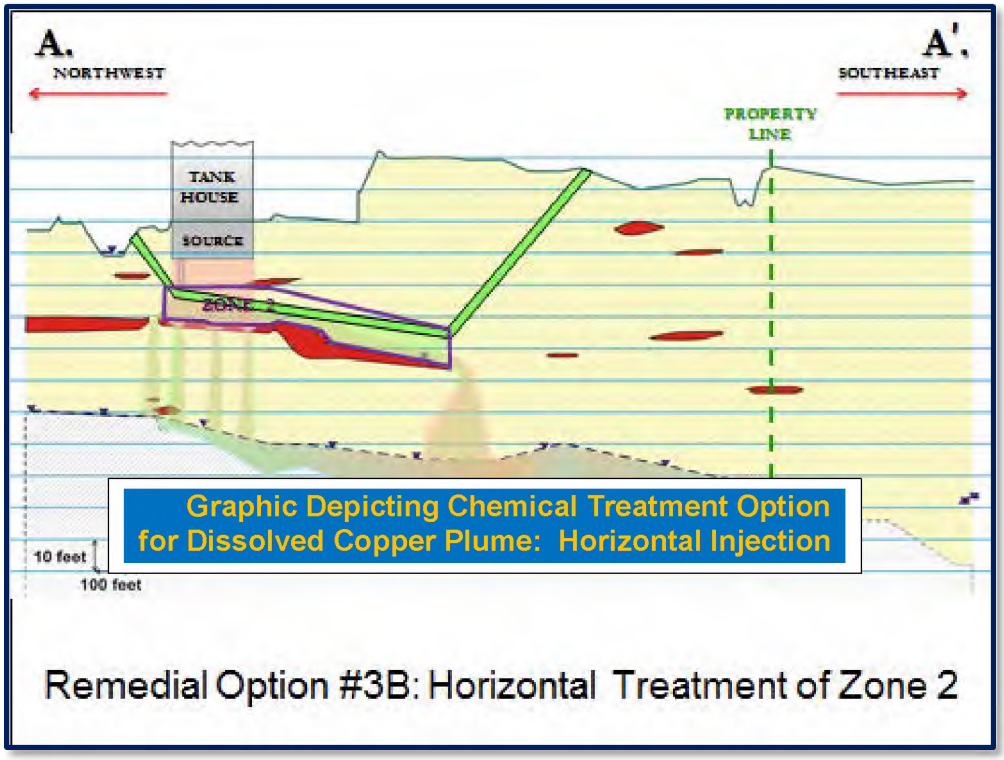
Kestrel's field investigations (well installation and soil/groundwater sampling) and detailed review of existing data revealed that the magnitude (size and strength) of the source area affecting soil and groundwater quality was much greater than previously thought, which explained why COC concentrations were increasing unexpectedly.

Kestrel provided several viable remedial alternatives to immobilize COCs in-situ. Alternatives included constructing mechanisms to prevent surface water infiltration and interaction within the source area and treatment of soils and groundwater by pH adjustment and injection of a prescribed blend of treatment chemicals.

Kestrel presented the associated net present value cost estimates. Each alternative illustrated the potential for long-term cost savings and a reduction in the duration of liability management; on the order of several decades.

Kestrel also presented alternatives to optimize the groundwater treatment process in the short-term.


A.
NORTHWEST
A'.
SOUTHEAST
PROPERTY LINE
TANK HOUSE
SOURCE
ZONE 1
BLACK MINGO
10 feet
100
Graphic Depicting Chemical Treatment Option for Dissolved Copper Plume: Vertical Injection
Remedial Option #3A: Vertical Treatment of Zone 1


A.
NORTHWEST
A'.
SOUTHEAST
PROPERTY LINE
TANK HOUSE
SOURCE
ZONE 2
10 feet
100 feet
Graphic Depicting Chemical Treatment Option for Dissolved Copper Plume: Horizontal Injection
Remedial Option #3B: Horizontal Treatment of Zone 2

Demolition / Deconstruction of Two Closed Fertilizer Plants

Prepared contract documents and managed procurement of contractors for the dismantling and removal of closed fertilizer manufacturing facilities. One of the facilities had previously been sold and was partially demolished by the Buyer. The facilities had not been completely closed prior to sale, and the manufacturing company reacquired the facility to implement a removal action in accordance with a USEPA Consent Agreement. The dismantling procedures eliminated the potential for releases of gas or hazardous constituents. Ultimately, more than 1 million board feet of lumber were reclaimed from each of the two enormous facilities. Documented savings approached $1 million per facility in comparison to conventional demolition and disposal.

The IMC Global Arkwright Fertilizer Manufacturing Facility, Spartanburg, SC, During Dismantling

Expert Consulting in Environmental Justice Suit

Led the effort for expert consulting for the defense counsel in a $500 million class action lawsuit involving claims of property value diminution, health impairment and environmental impairment in a coastal environment. Through forensic engineering and science, bolstered by extensive research of historical aerial photography and municipal and state public records, the defense was able to virtually eliminate several technical arguments presented by the plaintiffs' legal counsel.

A site in Florida was closed by the Potentially Responsible Parties under CERCLA consistent with an approved Remedial Investigation/Feasibility Study, Remedial Design/Remedial Action plan, and construction program. There was an in-place monitoring program and a defined maintenance program for the site. A class action suit was filed alleging contamination of groundwater and a downgradient river and bay with a resultant adverse effect on property values for a large number of land owners.

- Evaluated the industrial operations in the area reflective of when the industry was in business, and evaluated potential off-site pathways from both historical operations and those that could be alleged during closure and in post closure.
- Using aerial photos and historical information, evaluated land development in the area including an adjacent Interstate highway and interchange.
- Used the aerial photos to determine potential runoff patterns and what may have been included in that runoff, including whether the runoff had the potential to recharge groundwater with any contaminants.
- Further evaluated the potential for transport of contaminants making use of wells that were put in place during a number of study phases and those associated with post closure.
- Working with a law firm, developed a defensible analysis of what had happened over the period of time in question and were prepared to testify concerning both that and the efficacy of the CERCLA remedy.

The forensic evaluation approach used developed a detailed timeline with correlating events that directly related to the potential for contamination of the aquifer in question. The forensic evaluation pointed out a number of weaknesses in the plaintiff's allegations and supported the remedy in place.

Aerial View of Site and Surroundings

Facility Audits: Regulatory/Consent Agreement, Pre-acquisition, Post-Acquisition, Management System, Triage, Forensic

Conducted a wide range of audits and process improvement reviews over the past 35 years:

- audits ordered as a condition of enforcement settlement and criminal prosecution, including RCRA/HSWA-based criminal matters;
- reviews, technical support, and technical support of intervention advocacy by legal counsel to terminate criminal investigation and prosecution;
- RCRA/HSWA compliance, process improvement, and exemption/exclusion documentation;
- CERCLA/SARA compliance and process improvement;
- EHS management system audits, performance measurement, and system design improvement – straight regulatory, ISO, Responsible Care®;

- pre-acquisition for negotiation and integration planning;
- post-acquisition real-time triage.

Developed sets of RCRA/HSWA compliance manuals and conducted RCRA compliance training for groups of ten to one hundred – including GM Central Foundry Division environmental managers in 1980.

Post-Acquisition Environmental, Health and Safety Audit and Triage

Assisted legal counsel with an environmental, health and safety review of a family owned electronics manufacturing company that had been acquired by a much larger corporation as part of a program to secure dominant market share. The purchase agreement called for a comprehensive post-acquisition audit with cost for rehabilitation of deficiencies in environmental, health and safety compliance to be paid by the Seller. The post- acquisition audit revealed many serious deficiencies not identified in the pre-acquisition review. Among them were serious shortcomings in RCRA generator compliance, wastewater discharge permitting, air management permitting and equipment, SARA Title III reporting, and virtually every aspect of health and safety management.

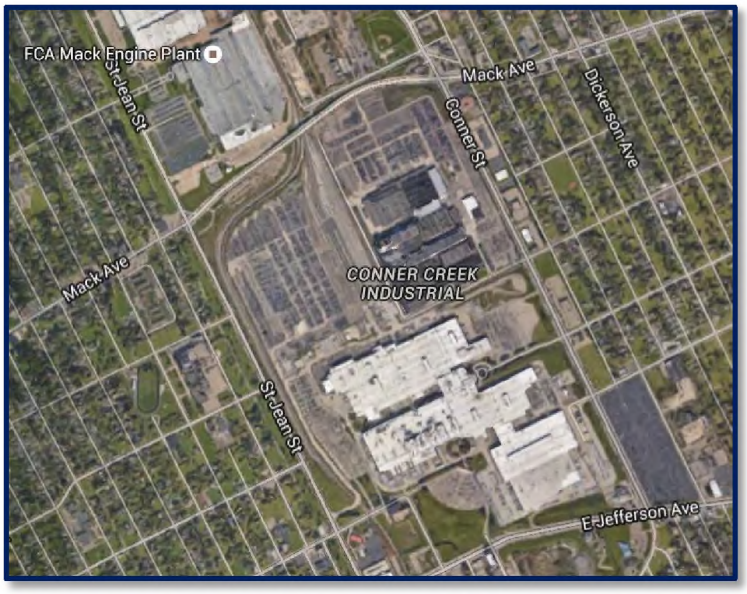
Since this was a corporate acquisition and not an assets acquisition, the Buyer had assumed full responsibility for compliance with all permits, laws and regulations. Bill Stephens worked with a health and safety consultant, and legal counsel to perform a "triage" on environmental, health and safety compliance deficiencies. In less than 24 hours on-site, a 60 page generator compliance manual was produced, complete with checklist, contingency plans, definition of roles and responsibilities, and training program outlines.

Major gaps in water discharge permitting were filled on a temporary basis and the most serious deficiencies in air permitting and operational practices were filled. Health and safety programs also posed serious challenges, since two recent post-acquisition accidents had cast a spotlight on the facility. In the days that followed the audit, the most serious deficiencies in planning documents were eliminated and priorities established.

Comprehensive Environmental Audit and Master Environmental Plan Recommendations for Large Chemical Manufacturing Complex

Led an environmental audit team in collaboration with and under the direction of legal counsel at a major chemical manufacturing facility that was subjected to an extensive multi-media inspection the US EPA and criminal investigation by the US Justice Department. The audit was performed as part of a consent agreement to address issues raised in the inspections and investigation. Recommended approach to terminate exposure to RCRA corrective action linked to alleged mixture of listed hazardous wastes with waste oil, and to management of RCRA Subtitle C exempt materials. Criminal investigation was terminated without charges.

Environmental Liability Pilot Audits of Industrial, Commercial, and Residential Parcels in Detroit for Construction of New Automobile Manufacturing Plant



Developed Phase I audit protocols and led the pilot audits of 12 commercial/industrial parcels and 850 residential parcels in East Detroit in preparation for public taking and construction of a new automobile manufacturing plant. Parcels included former explosives manufacturing plant and the original Hudson and Maxwell automobile manufacturing plants. The 350 acre area comprising 1000 original parcels is now the site of a Chrysler manufacturing plant.

Termination of RCRA TSD Liability

Performed an assessment of 17 TSD units that had been included in a RCRA Part A Interim Status permit application, to minimize liability exposure for RCRA Part B permitting. Developed a strategy and supporting documents to withdraw 13 units based on exemptions, e.g. *de minimis* losses to surface impoundment, thermal unit redefined as air pollution control device, tanks redefined as process tasks. Three units withdrawn on the basis of errors by the company in the original Part A, and one unit was converted to less than 90 day storage, using the short term storage exemption. End result: No Part B needed. Total cost of effort: About one tenth of the projected costs of the RCRA Part B permit application, not including trial burns or ground water monitoring.

Public and Employee Communications on Hazardous Waste/Hazardous Substance Issues

Led an investigation team and testified to UAW representatives regarding emissions from on-site treatment of reactive hazardous wastes. Concern over emissions had led to a full plant walkout two days before, stopping production at a 2500 person facility. Some adjustments in the treatment process were made, and production resumed uninterrupted by the issue.

Conducted weekly media briefings on an ultra-hazardous waste remediation project that had generated local furor in previous months while under USEPA direction. The first press conference with television and print media lasted nearly 90 minutes. By the third conference, the media reporters were filing reports that focused on the hard work of the site workers and the extensive safety precautions being taken. The project was completed with no third party suits, and cleanup received praise from several of the neighbors.

Developed newsletters and conducted individual and group discussions with neighbors of an NPL site for eight years, during the RI/FS/RD/RA process. The site was surrounded by expensive homes. The plan developed included on-site treatment and disposal of 55,000 cubic yards of sludge and affected soil. The project was completed with full community support, and no claims for reduction of property values were ever made. There is site is now the YMCA Hollingsworth Outdoor Center.

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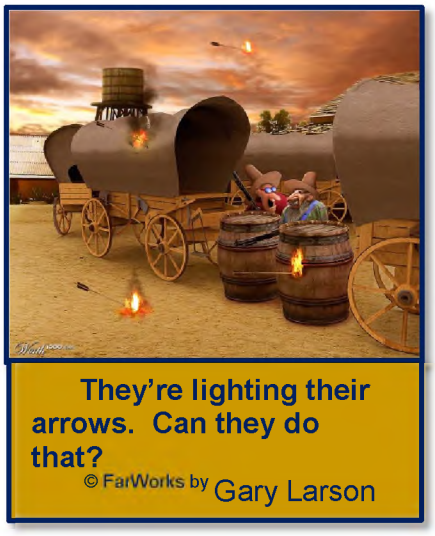

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Presentation to the American Bar Association's Litigation Conference, 1996 – "Success Strategies for CERCLA Litigation and PRP Actions"

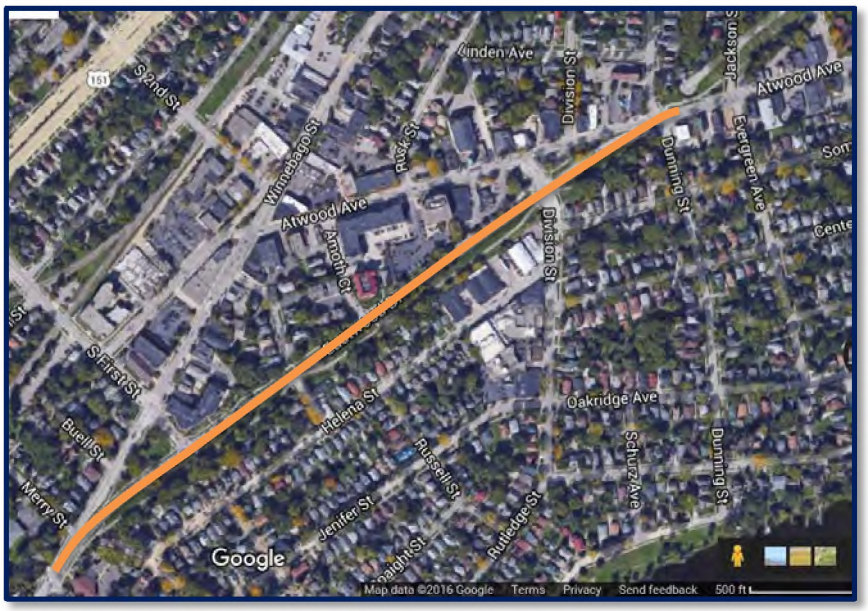
Conceived and presented "The Process Model" for use in technical case development (defense or plaintiff actions) for environmental impairment liability litigation. Presented a combined mass and toxicity model for cost allocation developed for the Aqua Tech Removal Action.

The Process Model for Equitable PRP Cost Allocation

- ***Employs the same methods as are used for waste characterization, waste minimization, and pollution prevention assessments.***
- ***Can be used to "reconstruct" the contribution of generators who ceased operation long ago.***
- ***The idealized sequence for evaluating and documenting hazardous substance contribution is:***
  - ***Use records and interviews to establish historical product lines.***
  - ***Draw detailed process flow diagram(s)***
    - ***Use literature and records***
    - ***Consult process experts***
    - ***Interview former company engineering or production personnel***
    - ***Start with unit processes***
    - ***Add raw materials and maintenance substances***
    - ***Add natural resources (air, water, minerals, energy) input***
    - ***Add emissions, discharges, and solid waste***
  - ***Develop a mass balance, reconciling unit process inputs to outputs.***
    - ***Consider effects of unit processes, e.g., evaporation, chemical reactions, thermal changes.***
    - ***The more crude and variable the process input, the more difficult and inexact the mass balance - but this is an essential step.***
    - ***Use SARA Title III, Hazardous Waste Generator and TSD reports, Wastewater and Air Pollution Control reports, and permitting and compliance documents.***
  - ***Conduct interviews on fate of materials containing hazardous substances***
    - ***Use attorney-client privilege***
    - ***Use the process flow diagrams as a road map - improve them with new information***
    - ***Account for fate of all residual waste and maintenance wastes on the diagrams***
    - ***Search out purchasing, maintenance, hauling and site operations personal***
    - ***Talk to neighbors***
    - ***Find "Smitty" (the 80-year old that knows everything that nobody wrote down)***
  - ***Focus on materials that may have contained hazardous substances, some portion of which went (or is alleged to have gone) to the site in question.***
    - ***Use diagrams and mass balance to demonstrate whether/how much of each material in question went to the site over what time frame - and how much went elsewhere.***
  - ***Prepare a storyboard***
    - ***Use simplified Process Flow Diagrams, Mass Balances, and Evidence of Fate***
    - ***Have the detail as backup***
  - ***Link results to the effect on cleanup difficulty, technology selection and cost***
    - ***Consider current RCRA implications***
      - ***ARARs on site, and recycling and Land Disposal Restriction regulations off site.***
      - ***Listed wastes vs. characteristic wastes***

Streets and Storm Sewer Construction Inspection – Atwood Avenue Bypass

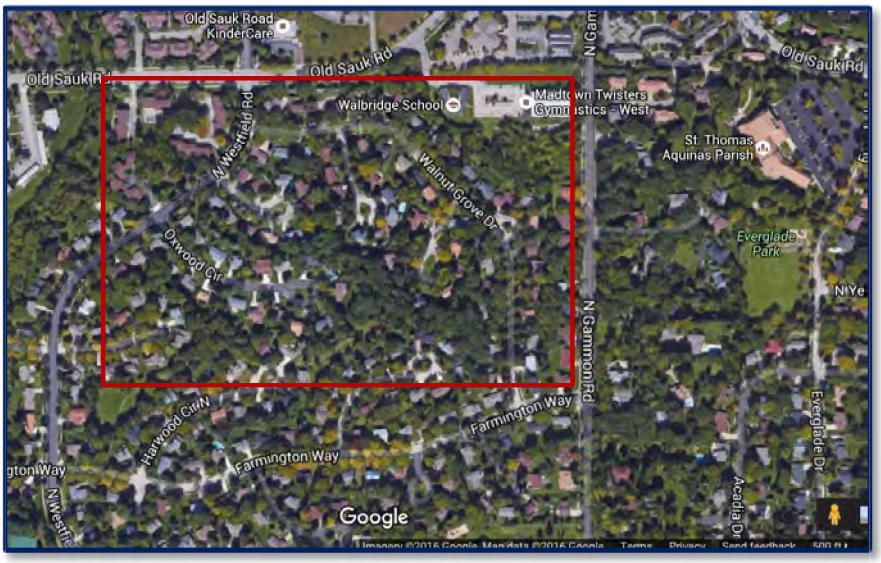
Performed on-site full time construction inspection for grading and paving of Eastwood Drive – "The Atwood Avenue Bypass" – in Madison Wisconsin. Eastwood Drive was new concrete construction along the right-of-way of a main line urban railroad. Major storm water piping, including a 60" concrete pipe jacked under the main line railroad, was part of the project.



Eastwood Drive Shown SW/NE in Center of Photo

Land Surveying for Subdivisions

Served as instrument man and lead chain for platting of several subdivisons.



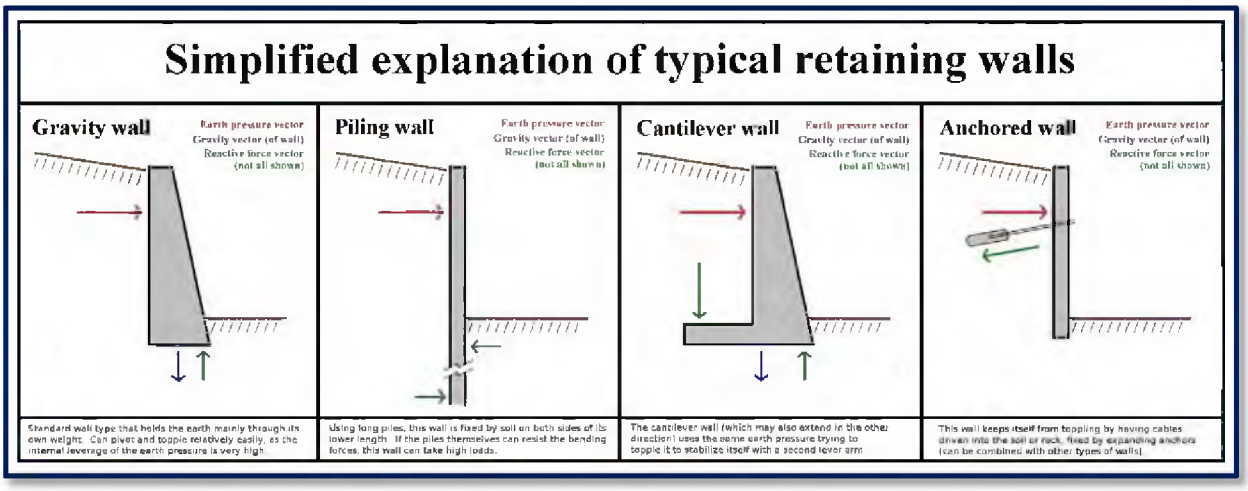
Example Subdivision in Madison, Wisconsin

Lakeshore Revetments – Cherokee, Yahara River, James Madison Park including Alternatives Analysis

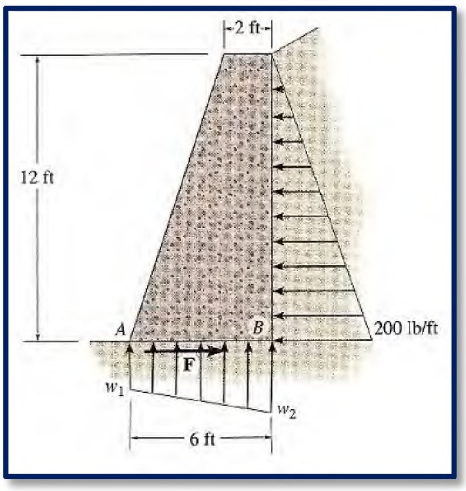
Performed construction inspection for several natural stone lakeshore revetments. Performed engineering alternatives analysis and designed selected alternative – a gravity retaining wall – for a one-half mile stretch of lakeshore in Madison, Wisconsin.

Example Natural Stone Revetment

Example Rip-Rap Revetment



Basic Explanation of Typical Retaining Walls



Retaining Wall Cross Section Similar to the One I Designed for James Madison Park

Lakeshore Wall at James Madison Park

Commissions, Boards, Committees, Councils, Regulatory Agencies, Public Meetings

Made presentations at a wide range of commissions, boards, committees, councils, regulatory agencies, citizen groups, neighborhood associations, and public meetings over 40 years. Examples include:

- City of Madison, Wisconsin Board of Public Works
- City of Madison, Wisconsin Planning Commission
- City of Madison, Wisconsin Urban Design Commission
- State of Wisconsin Board of Land Commissioners (State Treasurer, Secretary of State, Attorney General)
- Dane County, Wisconsin Zoning Board
- City of South Milwaukee, Wisconsin Zoning Board
- Greenville County, South Carolina Public Works Committee
- Holly Tree Homeowners Association on Adjacent Superfund Site Remediation Plan

- Public Meeting on AquaTech/Groce Labs Emergency Removal Action – Duncan, SC
- United Auto Workers Regarding Perceived Health Threat and Union Walkout of 2,500 Employees at GM Plant
- Board of the Synthetic Organic Chemical Manufacturers Association (SOCMA) at Waldorf Astoria in NYC
- Many conferences – too many to count

Litigation, Permitting, Enforcement

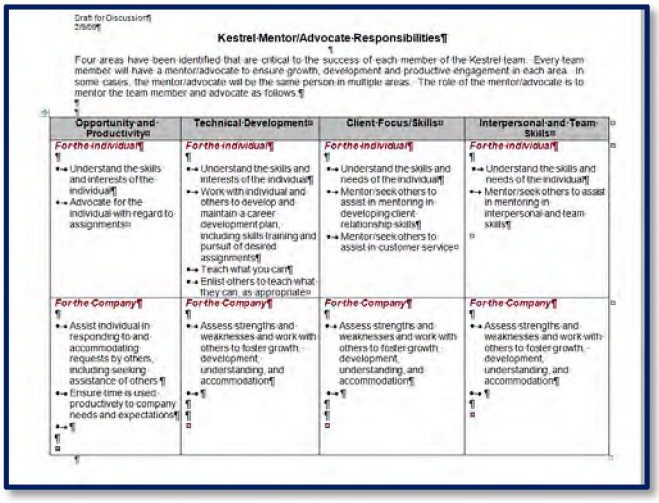
Have represented industry and selected governmental entities in litigation, permitting, and enforcement defense for more than 35 years. Have often lead negotiations with regulatory agencies. Have worked with nearly 200 attorneys.

Held all permits and was responsible for all environmental, health, and safety compliance, as Trustee, for nearly 11 years- the entire duration of Kestrel Horizons' service to the Pinewood Site Custodial Trust. Permits included the closure and post-closure hazardous waste facility permit, the air quality management permit, the storm water discharge permit, the drinking water supply permit, and the mining permit for this 535 acre former commercial hazardous waste treatment and disposal facility.

Program Development and Management
for Large EHS/ Manufacturing Design Consulting Firm

Led Task Forces and Operating Programs in Project Management, Construction Management and Technology Development for a major EHS/manufacturing design consulting firm.

Personally authored, conceived or edited most of the Project Management tools, guidance, and training materials. Led training in project management, consulting and problem-solving skills, teamwork and conflict resolution, and innovative techniques. Developed and taught problem definition, master planning, purpose-based design, and client advocacy methods.



Project Real Cost Pilot
for the Synthetic Organic Chemical Manufacturers Association (SOCMA)

Served as Team Leader and principal system designer for SOCMA's Project Real Cost Pilot. Designed and led the testing of an Activity-Based Costing model to define the total cost of environmental, health, and safety management for industrial companies. The methods were also used to determine the real cost of compliance with SARA Title III reporting, CAA Title V permitting, and the Risk Management Planning rules. The real costs were compared to the government estimates included in the original Regulatory Impact Analysis. The Team included key personnel of Kestrel, RMT, BTI Consulting Group, and McGladrey and Pullen.

In 1998, Kestrel completed ***Project Real Cost*** for SOCMA. The Kestrel team developed and applied activity-based costing models and tools to determine the Real Costs of comprehensive environmental, health and safety (EH&S) management in a project involving four member chemical plants located in three states. The Real Cost™ tools have been designed to minimize the time and effort to implement them, and to help in mapping the tasks and responsibilities needed to design a Responsible Care® Management System.

The team used the same basic approach, combined with specially-designed questionnaires, to determine the Real Costs of compliance with USEPA estimates for SARA Title III reporting and CAAA Title V permitting. The work provides a major advancement in EH&S cost management. It also lays the groundwork for more productive dialogue between industry groups and regulatory agencies.

Results are striking and broadly useful:

- *Real Costs of compliance were shown to be 2 to 20 times the government estimates made during rulemaking*
- *Actual EH&S spending was 1.2 to 3.3 times the costs budgeted and tracked by the companies*
- *Average of 21.6% of annual capital spending was for EH&S*
- *Average of 10.1% of total labor costs was spent for EH&S*
- *Many detailed issues are documented in 300-page report and 25-page overview.*

Implications are significant:

- *SOCMA's assertions about the lack of accuracy of government estimates – especially for small batch manufacturing business - proved correct.*
- *SOCMA now has a powerful tool to use in constructive dialogue with Congress and the Executive branch.*
- *SOCMA now has a proven model approach for estimating the real cost of proposed regulations.*
- *SOCMA now has hard data to illustrate the industry's commitment to Responsible Care®.*

The Real Cost™ Tools and Approach are easy to use for periodic off-line analysis and benchmarking – especially for labor and capital costs. The approach can be readily taught and applied by industry managers with limited support, and do not require changes in the Chart of Accounts or accounting practices. The tools can also be adapted to interact with enterprise resource planning (ERP) software systems, such as SAP.

Kestrel is applying the Real Cost™ analysis models with individual clients to benchmark EH&S costs, and to lay the groundwork for implementation of improved Responsible Care® and EH&S management systems with lower costs.

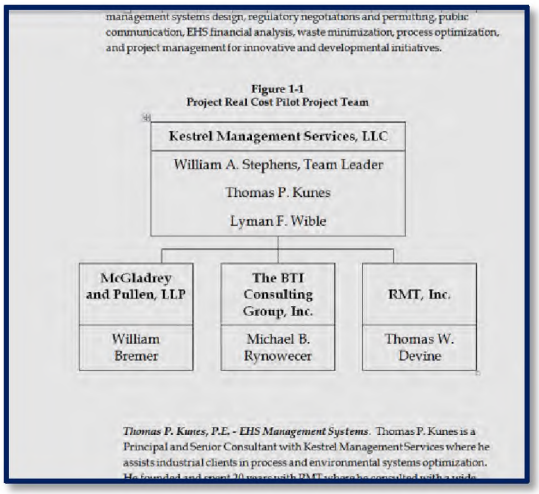

management systems design, regulatory negotiations and permitting, public communication, EHS financial analysis, waste minimization, process optimization, and project management for innovative and developmental initiatives.

Figure 1-1
Project Real Cost Pilot Project Team

Kestrel Management Services, LLC
William A. Stephens, Team Leader
Thomas P. Kunes
Lyman F. Wible

McGladrey and Pullen, LLP — William Bremer
The BTI Consulting Group, Inc. — Michael B. Rynowecer
RMT, Inc. — Thomas W. Devine

Thomas P. Kunes, P.E. - EHS Management Systems. Thomas P. Kunes is a Principal and Senior Consultant with Kestrel Management Services where he assists industrial clients in process and environmental systems optimization.

Responsible Care® Management System Blueprint

Served as the "Knowledge Expert" on QTech Systems, Inc.'s *Responsible Care® Management System Software Development* Project Team. Introduced QTech to SOCMA as the recommended contractor for SOCMA's effort. The purpose of SOCMA's project was to develop a "blueprint" for implementing a Responsible Care® Management System, which would serve each Responsible Care® participant, whether the participant employs software or a paper-based system. Completed the conceptual blueprint, and worked with QTech in evaluating EHS software available to meet specific needs of the system. Kestrel is applying concepts contained in the Responsible Care® blueprint to EHS management systems for individual companies. This conceptual blueprint, developed in 1998 and early 1999, is remarkably similar to the concepts introduced by the American Chemistry Council a few years later – Responsible Care Management System (RCMS)® and RC14001.

Served as the "Knowledge Expert" on QTech Systems, Inc.'s *Responsible Care® Management System Software Development* Project Team. Introduced QTech to SOCMA as the recommended contractor for SOCMA's effort. The purpose of SOCMA's project was to develop a "blueprint" for implementing a Responsible Care® Management System, which would serve each Responsible Care® participant, whether the participant employs software or a paper-based system.

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- *The team must always remember that the focus is practical systems, tools and training for small companies and small plants. Things that work well and are appropriate for large companies and large plants will fall of their own weight when applied to small companies and small plants.*

- *Focusing on smaller operations doesn't mean "dumbing down" systems designed for large operations. It means crafting the systems, tools and training with an understanding of the dynamics of small businesses and small operations.*

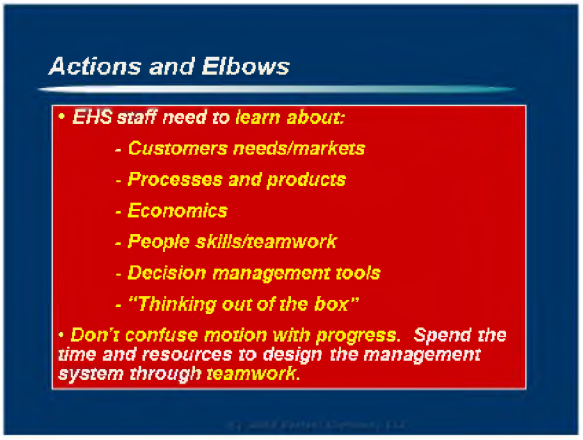
- *The efforts should make maximum use of available resources to minimize costs and produce results as soon as possible. Time is of the essence.*

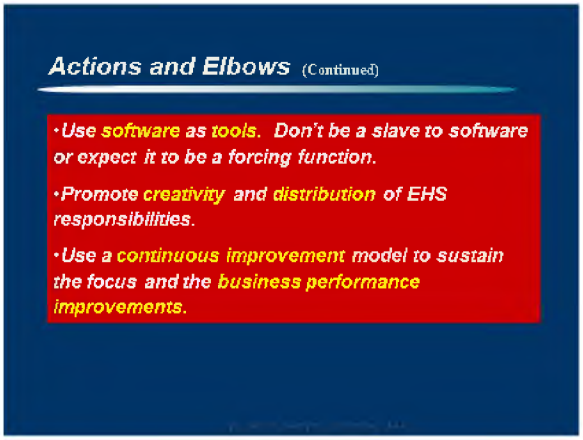
  - *SOCMA and the ACC have already developed many useful tools and pieces that should be used constructively. In particular, SOCMA's Responsible Care® Toolkit and the Responsible Care® Management System Blueprint will be useful.*

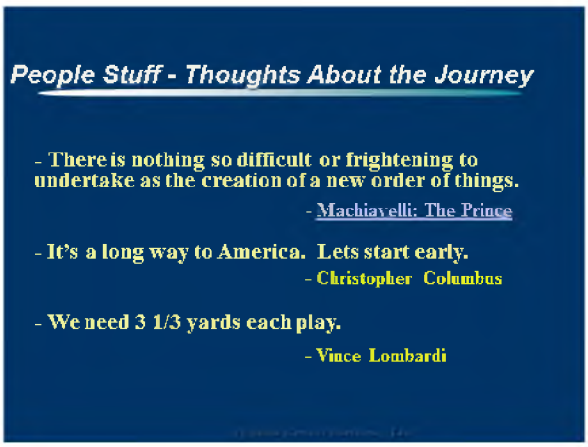
  - *Kestrel has developed several management system models, numerous templates and electronic tools that can be shaped to meet SOCMA members' needs.*

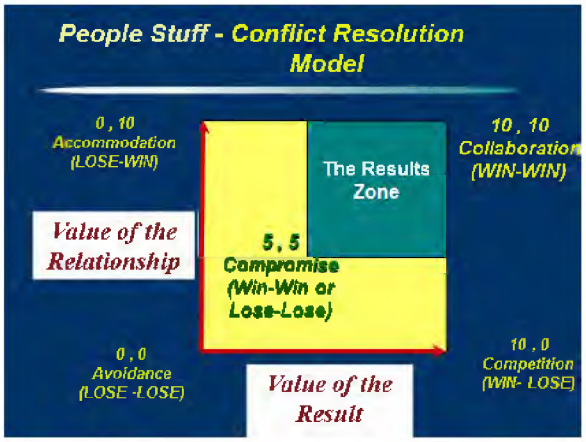
  - *There are many support tools available free or at very low cost that can be used to help fill gaps.*

- *Every company will want to shape Responsible Care® systems and tools to meet their needs and priorities, and to mesh with the company's culture. Some will want to incorporate the RC system with quality management systems; some with regulatory compliance systems; some with their ISO 14001 system. And for some, this will be the first application of a system based on continual improvement and readily verifiable documentation. Each must be able to "start from where they are" and get to a useful result with a reasonable effort over several months – not several years.*









Planning and Management of Change

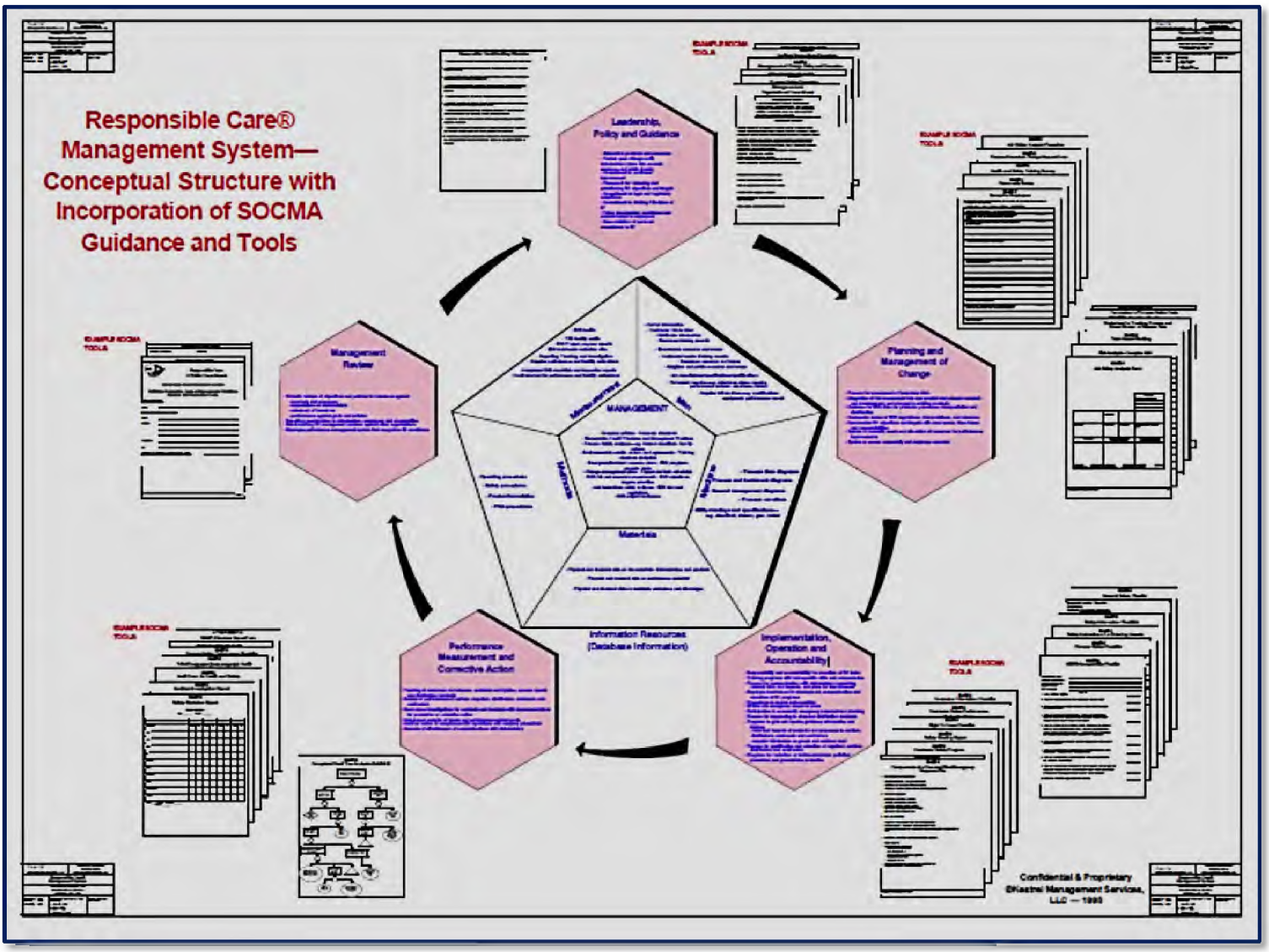
Management System Attributes:

- process for assessment of hazards and risks
- integration of risk assessment into new product and process research and development, and changes to existing products
- database for EHS risks for products, processes, transportation and distribution
- systematic review of EHS regulations, interpretations and relevance
- documented RC objectives and targets with clear means, time frames, and responsibilities
- system to identify needs and allocation of resources for performance improvements
- system to assess community and employee concerns

Relevant Codes:

Environmental Aspects and Impacts / Health and Safety Hazards and Risks

EHS-7.	Methods to identify and evaluate potential health and safety hazards in planned or existing facilities, including facilities to be modified.
EHS-8.	Exposure assessments and safety analyses to evaluate health and safety hazards to employees from: processes; equipment; potentially hazardous chemical, physical or biological agents; or other work site conditions.
EHS-11.	Mechanisms for reviewing the design and modification of facilities and job tasks, taking into account the following hierarchy of controls: inherent safe design; material substitution; engineering controls; administrative controls; and personal protective equipment.
CAER-7.	An outreach program to educate responders, government officials, the media, other businesses and the community about the facility's emergency response program and risks to the community associated with the facility
CAER-11.	An ongoing assessment of potential risks to employees and local communities resulting from accidents or other emergencies.
PS-11.	Consideration and mitigation of the potential safety effects of expansions, modifications and new sites on the community, environment and employees.
PP-2.	**Evaluation** A quantitative inventory at each facility of wastes generated and releases to the air, water and land, measured or estimated at the point of generation or release.



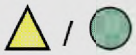
People Stuff - Motivation

People will work hard and embrace change if:

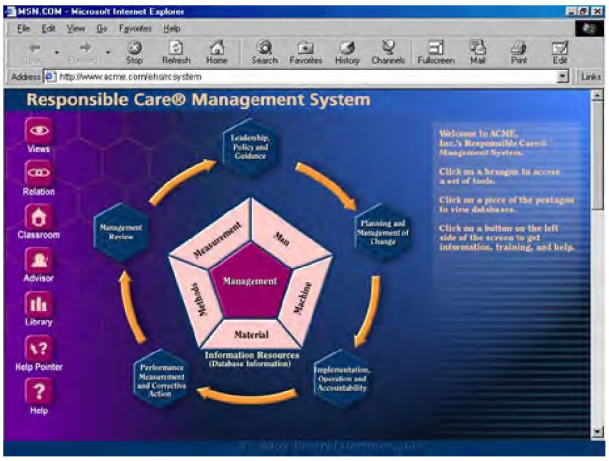
- *They believe that what they are doing is worthwhile.*
- *They perceive that they are making progress.*
- *They are recognized for their contributions.*

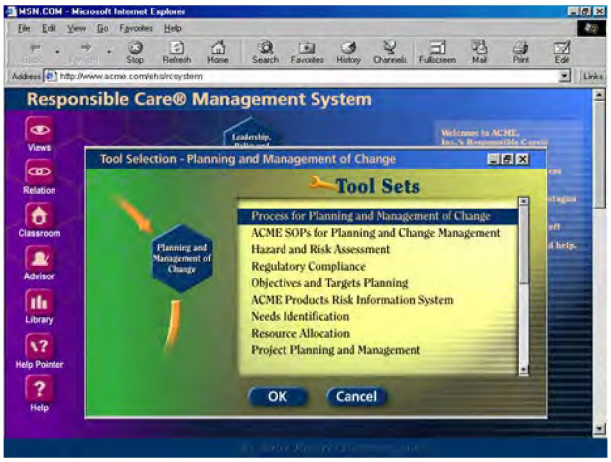
Optional Strategies for Environmental Compliance

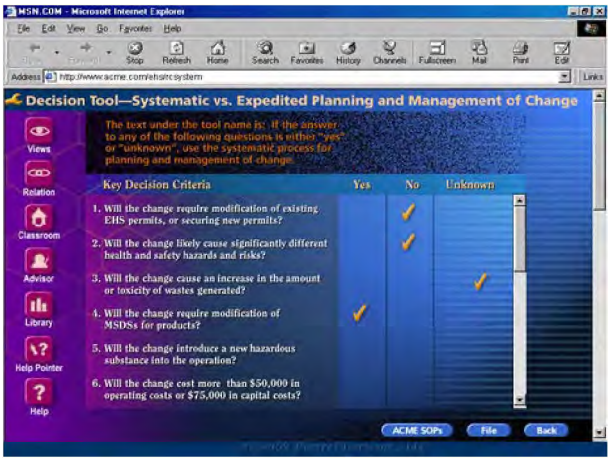
	Reactive	Responsive	Progressive
Outlook	0 to 1 Year	1 to 2 Years	2 to 20 Years
Motivation	Situational Respons to Enforcement	Compliance with Laws and Regulations	Ability to Predict and Control Events and Actions
Planning	None	Permits, Reports, Investigations and Other Near - Term Compliance Projects	Detailed Environmental Assurance Program
Implementation	Staffing to Meet Situation Needs	Staff / Resource Commitments to Meet Routine Monitoring and Compliance Needs	Staff / Resource Commitments to Carry Out Quality Assurance Program
Cost / Risk	Low Initial Cost / High Risk with High Liabilities	High Cost / Lower Risk with Lower Potential Liabilities	Highest Initial Cost / Lowest Risk with Limited Liabilities; Able to Allocate Resources by Priority

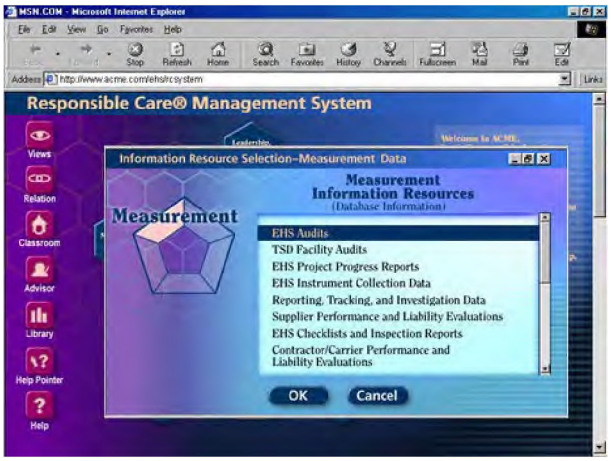
	Management System Attribute	Responsible Care® Management Practice	Need	Key Resources Available	Gap Analysis
23	*5. documented procedures to ensure safe operations for all processes, process changes, maintenance, and product handling and storage.*	**PSM 7** – Current, complete documentation of process design, operating parameters and procedures. **PSM 8** – Current, complete documentation of information relating to the hazards of materials and process technology. **PSM 10** – Management of changes to chemical operations … **PSM 12** – Facility design, construction and maintenance using sound engineering practices consistent with recognized codes and standards. **PSM 13** – Safety reviews on all new and modified facilities … …ction programs … …h technology, …d equipment during **PSM 18** – Establishment of procedures and work practices for safe operating and maintenance activities. **EHS 4** – Written, up-to-date health and safety … procedures appropriate to the facility. **EHS 13** – Preventive maintenance and housekeeping programs to maintain the safety of facilities, tools and equipment. **EHS15** – Security procedures and systems to control entry and exit	A) Store, update, and track data on all processes ▪ Design ▪ Operating parameters ▪ Procedures ▪ Process data ▪ Materials hazards ▪ Process technology hazards B) Store, update, and track data from maintenance and inspection programs C) Means of managing changes in a way that ensures the safety of all stakeholders and protects the environment D) Means of carrying out safety reviews on new and modified facilities E) Means of ensuring that processes and equipment are controlled during emergencies F) Means of implementing and carrying out maintenance and inspection programs G) Means of writing effective	▪ SOCMA tools -e.g., Guide to Process Safety, and Training Seminars on Process Safety Management, and CMA tools such as CMA's Guide on Managing Process Changes ▪ Paper and computerized tools for process hazard analysis, process safety management and risk management planning, e.g., Risk Management Plan Assistant Software from Envirowin ▪ risk analysis tools, e.g., software by JF and by Dyadem ▪ guidance and tools for EHS procedures development, e.g.,Thompson Publishing Tools for Environmental Health and Safety ▪ preventive maintenance tools, e.g..software tools such as SAP or EMSoft 2000 or Caribou., and other more general tools such as Datastream maintenance management software. ▪ rapidly emerging tools on	A /  B  C /  D  E /  F, G, H, I, J 

Detailed Gap Analysis Employed in Development of Responsible Care® / ISO 14,000 Management System Blueprint









Environmental, Health and Safety Management System Choices

There are several possible structures for an Environmental, Health and Safety (EHS) Management System, any of which could be the right choice for a particular company at a point in time. There are two essential components that must be incorporated in order to produce a system:

- **EHS Information Management**
- **EHS Process Management**

EHS Information covers a wide range of documents – both paper and electronic. A partial list follows:

- Regulations and regulatory guidance
- Chemical use and MSDS information
- EHS Audits
- Monitoring and testing data
- Contingency and response plans
- Job hazard analyses
- Permits and permit applications
- Photography
- EHS facility and equipment design plans
- Environmental modeling
- Reports and studies
- Process flow diagrams
- Process safety information
- Transportation and disposal information
- Correspondence

Historically, virtually all EHS Information Management consisted of paper filing systems. As computers and electronic forms of communication have gained capabilities and widespread use, most companies have found that a combination of paper and electronic documents must be manages. A small percentage of companies have set a goal of paperless information management; however, several factors, including the reliance of regulatory agencies and the public on paper documentation for certain purposes, indicate that EHS Information Management must include both paper and electronic documents.

EHS Process is a term that covers policies, procedures, practices, programs, projects and performance measurement. The EHS Processes employ tools, such as checklists and forms. EHS Processes create order out of what would otherwise be an enormous collection of seemingly unrelated tasks.

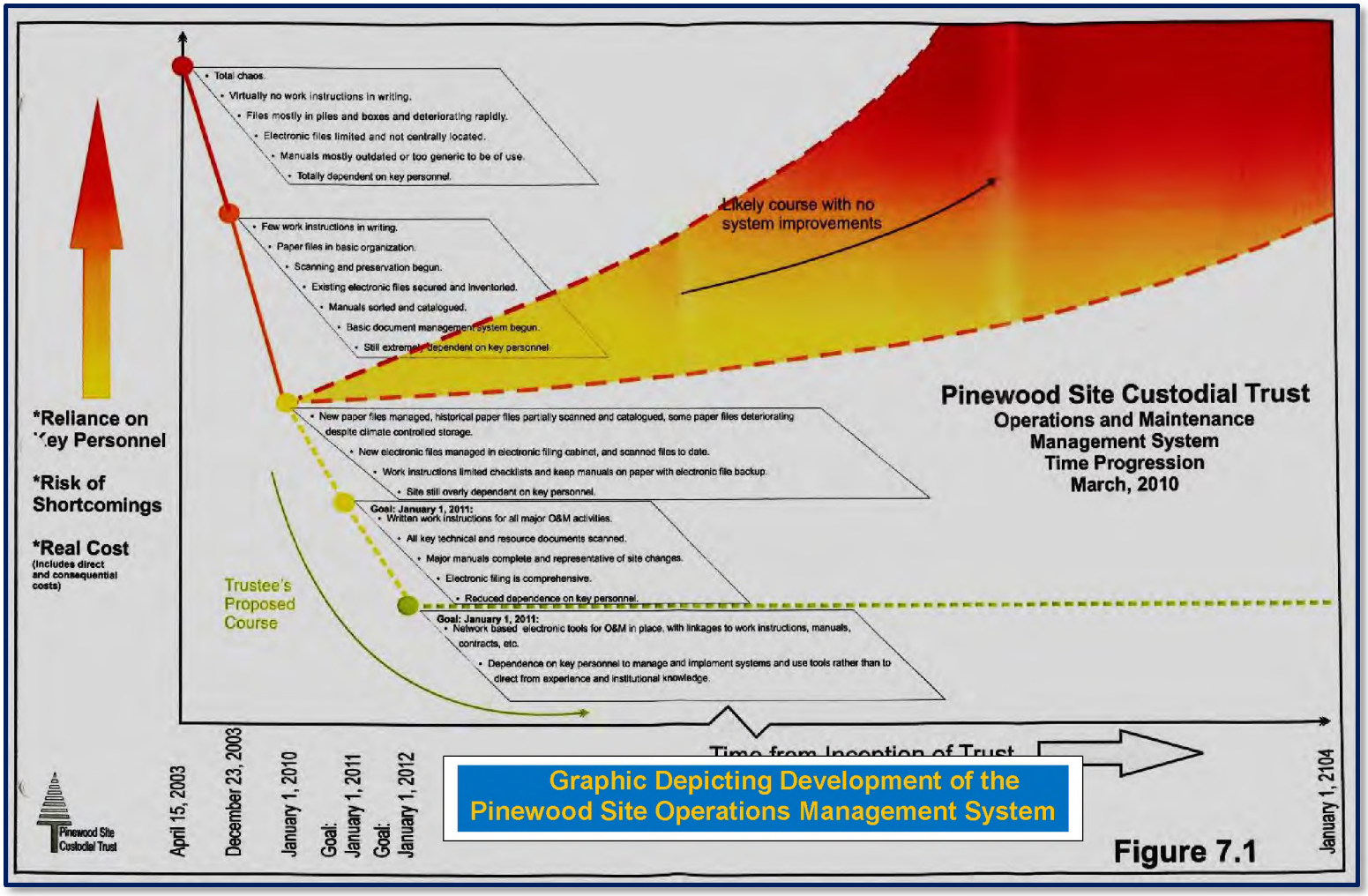
Some companies have established a priority on bringing solid “process” or “systems” thinking to EHS management. The ISO 14000 guidance is aimed at helping companies create an environmental management system that incorporates solid process management in a continuous improvement model. The ISO 14000 model is a foreshadowing of the next generation of ISO 9000 guidance on quality systems.

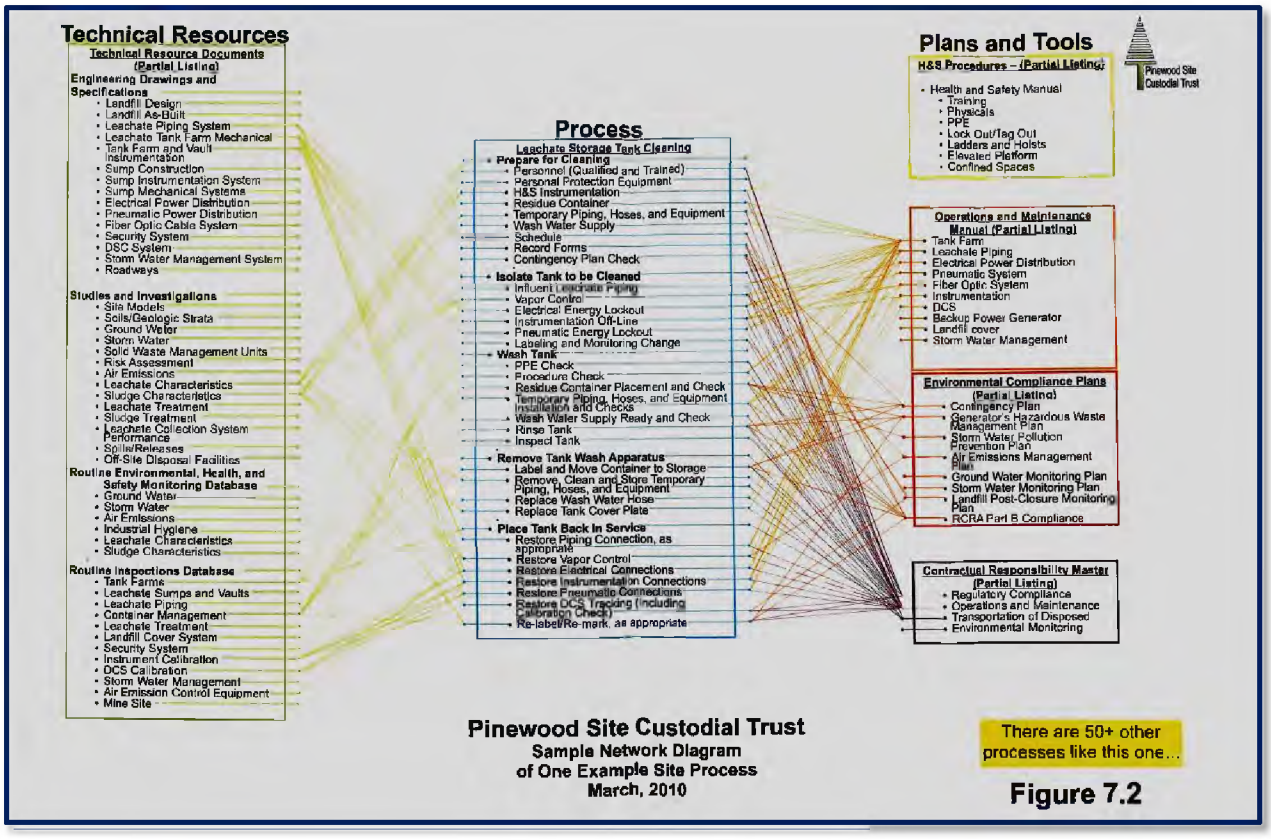
One way or another, companies must (1) manage a very large amount of EHS information ***and*** (2) use some processes to carry out EHS activities. The systems for these two essential

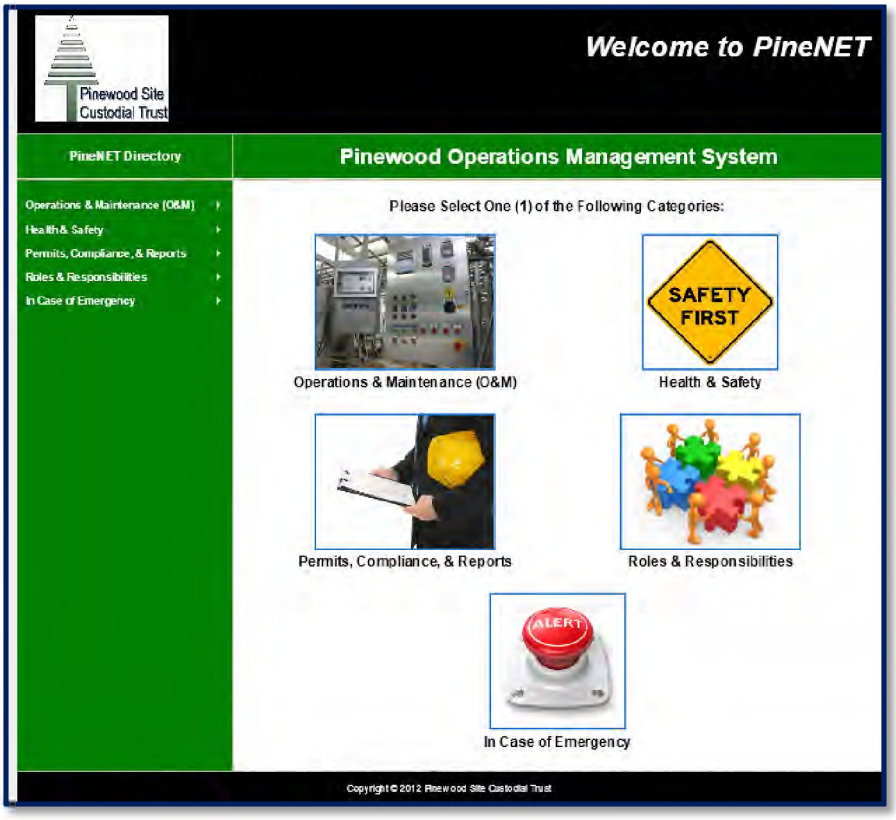
functions may be informal and loosely documented, or quite formal and well documented. These functions may be virtually separate or integrated. In general, the systems will tend to be less formal for smaller companies because fewer people are involved in the communications and the activities, and because the smaller companies often don't have the time to invest in developing EHS management systems.

Informal EHS management systems can work well, provided there is little turnover of staff and the EHS activities are straightforward and not subject to change. For batch and custom chemical manufacturers, EHS activities are complex and subject to change, almost regardless of size.

The primary motivation to become more systematic in any area of management is cost savings. In EHS management, risk reduction and liability management are closely related to cost savings. EHS liabilities include both corporate and personal exposures.




Technical Resources
Technical Resource Documents (Partial Listing)
Engineering Drawings and Specifications
• Landfill Design
• Landfill As-Built
• Leachate Piping System
• Leachate Tank Farm Mechanical
• Tank Farm and Vault Instrumentation
• Sump Construction
• Sump Instrumentation System
• Sump Mechanical Systems
• Electrical Power Distribution
• Pneumatic Power Distribution
• Fiber Optic Cable System
• Security System
• DSC System
• Storm Water Management System
• Roadways
Studies and Investigations
• Site Models
• Soils/Geologic Strata
• Ground Water
• Storm Water
• Solid Waste Management Units
• Risk Assessment
• Air Emissions
• Leachate Characteristics
• Sludge Characteristics
• Leachate Treatment
• Sludge Treatment
• Leachate Collection System Performance
• Spills/Releases
• Off-Site Disposal Facilities
Routine Environmental, Health, and Safety Monitoring Database
• Ground Water
• Storm Water
• Air Emissions
• Industrial Hygiene
• Leachate Characteristics
• Sludge Characteristics
Routine Inspections Database
• Tank Farms
• Leachate Sumps and Vaults
• Leachate Piping
• Container Management
• Leachate Treatment
• Landfill Cover System
• Security System
• Instrument Calibration
• DCS Calibration
• Storm Water Management
• Air Emission Control Equipment
• Mine Site
Process
Leachate Storage Tank Cleaning
• Prepare for Cleaning
• Personnel (Qualified and Trained)
• Personal Protection Equipment
• H&S Instrumentation
• Residue Container
• Temporary Piping, Hoses, and Equipment
• Wash Water Supply
• Schedule
• Record Forms
• Contingency Plan Check
• Isolate Tank to be Cleaned
• Influent Leachate Piping
• Vapor Control
• Electrical Energy Lockout
• Instrumentation Off-Line
• Pneumatic Energy Lockout
• Labeling and Monitoring Change
• Wash Tank
• PPE Check
• Procedure Check
• Residue Container Placement and Check
• Temporary Piping, Hoses, and Equipment Installation and Checks
• Wash Water Supply Ready and Check
• Rinse Tank
• Inspect Tank
• Remove Tank Wash Apparatus
• Label and Move Container to Storage
• Remove, Clean and Store Temporary Piping, Hoses, and Equipment
• Replace Wash Water Hose
• Replace Tank Cover Plate
• Place Tank Back In Service
• Restore Piping Connection, as appropriate
• Restore Vapor Control
• Restore Electrical Connections
• Restore Instrumentation Connections
• Restore Pneumatic Connections
• Restore DCS Tracking (including Calibration Check)
• Re-label/Re-mark, as appropriate
Plans and Tools
H&S Procedures – (Partial Listing)
• Health and Safety Manual
• Training
• Physicals
• PPE
• Lock Out/Tag Out
• Ladders and Hoists
• Elevated Platform
• Confined Spaces
Operations and Maintenance Manual (Partial Listing)
• Tank Farm
• Leachate Piping
• Electrical Power Distribution
• Pneumatic System
• Fiber Optic System
• Instrumentation
• DCS
• Backup Power Generator
• Landfill cover
• Storm Water Management
Environmental Compliance Plans (Partial Listing)
• Contingency Plan
• Generator's Hazardous Waste Management Plan
• Storm Water Pollution Prevention Plan
• Air Emissions Management Plan
• Ground Water Monitoring Plan
• Storm Water Monitoring Plan
• Landfill Post-Closure Monitoring Plan
• RCRA Part B Compliance
Contractual Responsibility Matrix (Partial Listing)
• Regulatory Compliance
• Operations and Maintenance
• Transportation of Disposed
• Environmental Monitoring
Pinewood Site Custodial Trust
Pinewood Site Custodial Trust
Sample Network Diagram
of One Example Site Process
March, 2010
There are 50+ other processes like this one...
Figure 7.2


Pinewood Site Custodial Trust
Welcome to PineNET
PineNET Directory
Pinewood Operations Management System
Operations & Maintenance (O&M)
Health & Safety
Permits, Compliance, & Reports
Roles & Responsibilities
In Case of Emergency
Please Select One (1) of the Following Categories:
SAFETY FIRST
ALERT
Operations & Maintenance (O&M)
Health & Safety
Permits, Compliance, & Reports
Roles & Responsibilities
In Case of Emergency
Copyright © 2012 Pinewood Site Custodial Trust

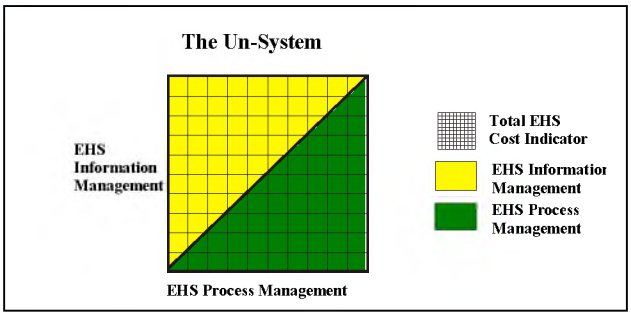
EHS Management System Models

The following is a graphic depiction of several different basic models for EHS Management Systems. Any will work, and all are used. The basic concept is that both the EHS information and the EHS process functions must be carried out.

The Un-System

In the first model, EHS information management is accomplished by the use of paper files, which are supported by basic electronic tools such as fax, word processing, spreadsheets, email, and limited special-purpose software (e.g., EHS monitoring databases, air modeling, chemical inventories and MSDS databases).

The EHS processes consist of a collection of individual tasks and projects that are updated periodically, as a very long "To Do" list. If policies and procedures exist, they sit on a bookshelf and are only marginally relevant to EHS activities and decisions made from day to day. There is little emphasis on EHS planning and management of change. Performance measurement and corrective action are limited to reacting to events, such as regulatory inspections. Most EHS responsibilities reside with an individual, and delegation is limited.

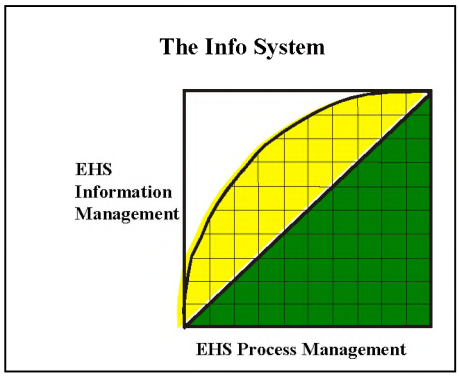


The Info System

The Info System employs current software technologies to make dramatic improvements in EHS information management. The system manages newly-created documents in electronic files, and the files are organized for easy retrieval by topic, key words, etc. Relational databases may be used, and the electronic files may include digital photography, graphics, and multi-media files. Email is used extensively, and the company may make use of its internet home page for communication with customers and the public about EHS issues.

The company may have a program to incorporate old EHS files into the electronic system through the use of scanners. Policies, procedures, forms, checklists and reports are published electronically; however, the electronic management of data is limited to electronic filing and routing via email.

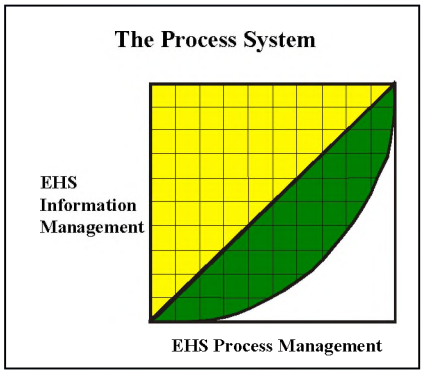
The EHS Process function in this model is essentially the same as in the Un-System model. There is little or no emphasis on EHS processes. The concepts of ISO 14000 and other continuous improvement models may seem foreign and irrelevant to these companies.



The Process System

The Process System model is the mirror image of the Info model. The management of EHS information in the Process model is essentially the same as in the UN-System. The management of EHS information is largely paper-based, with basic use of software common to American business offices.

The Process model emphasizes EHS management processes, incorporating EHS policies, procedures and practices into readily-understood systems to carry out EHS programs, projects and tasks. Delegation of EHS responsibilities, use of EHS information for decision making and use of EHS tools are addressed specifically. Processes for planning and management of change are well-defined, as are performance measurement and corrective action. The company may choose to apply or integrate their quality management program methods into the EHS functions. The concepts of ISO 14000 and any continuous improvement model seem familiar to these companies.

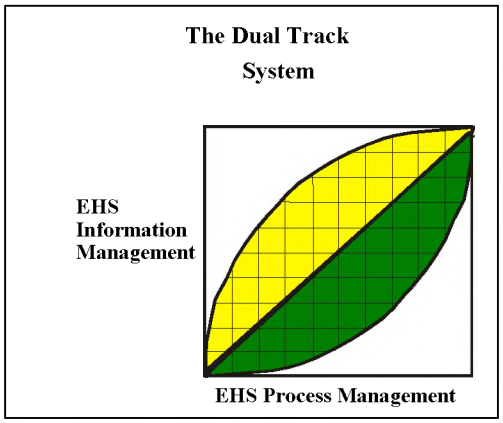


The Dual Track EHS Management System

The Dual Track EHS Management System model pursues the information system advancements of the Info System model, as well as the EHS process system focus of the Process System model – but on separate tracks. This model often originates by accident in medium - to - large companies. This happens when the Information Technology department has been tasked with improving information management systems, including those for EHS information, while the corporate EHS staff may be focusing on improving the EHS processes.

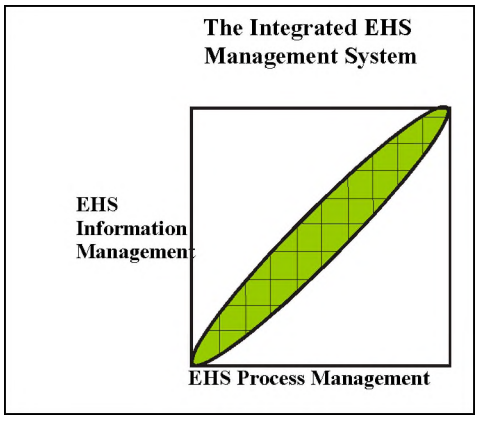
Sometimes, the same people are working on both initiatives, but see them as unrelated. Recent investments in expensive Enterprise-wide Resource Planning (ERP) computer systems may also cause this dual-track approach, since EHS staff are often directed to figure out how to use the ERP systems for their purposes because of the large sunk cost in the computer system. Most companies find, after a good deal of pain, that the ERP systems can only serve some portion of their EHS needs. This often creates a gap-filling approach to information that makes the company susceptible to the dual track.

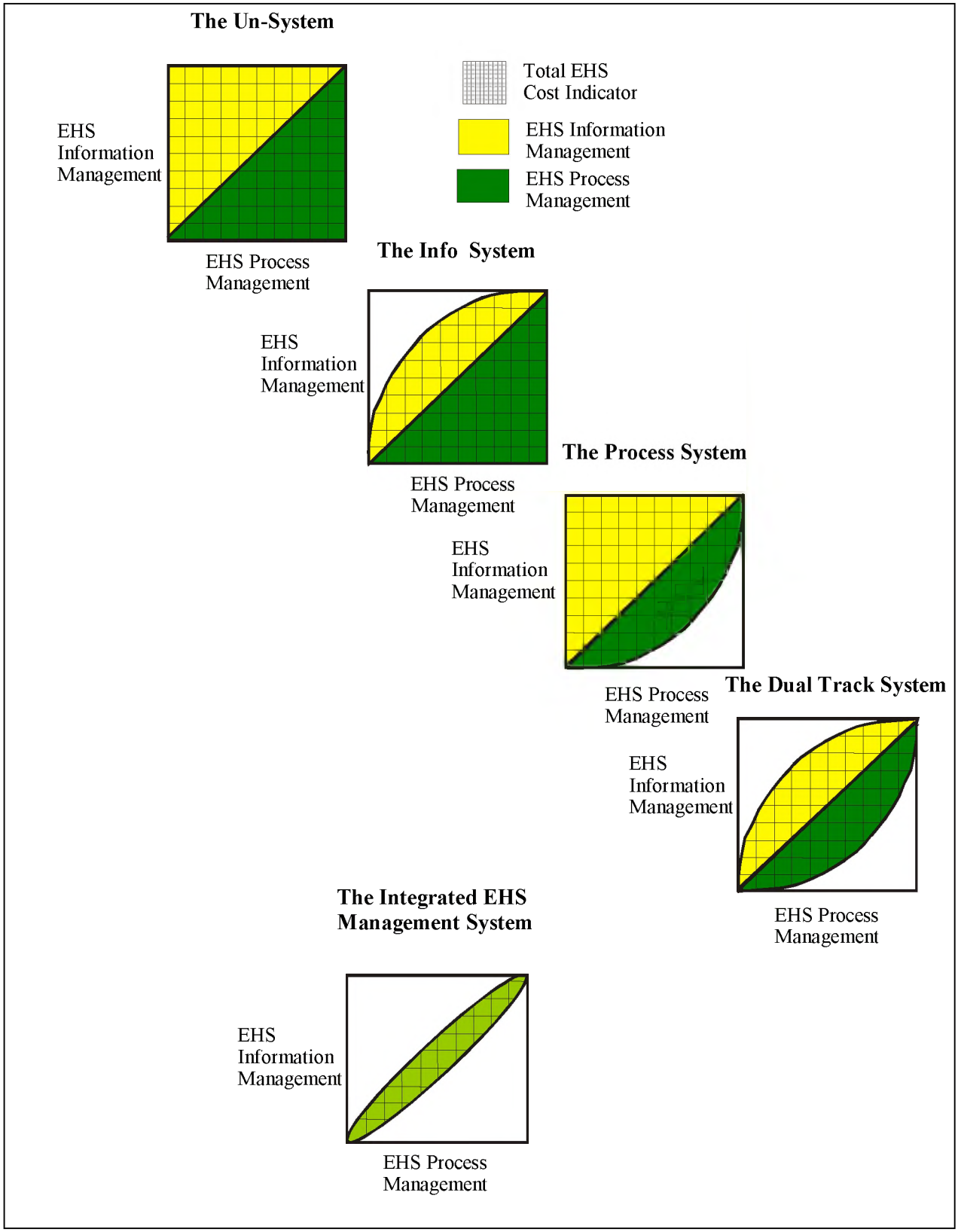
The Dual Track model will still likely reduce total EHS costs in comparison to the other models – except for very small companies and plants.



The Integrated EHS Management System

The Integrated EHS Management System model takes the Dual Track model to the ultimate efficiency and effectiveness by integrating electronic information management with well-defined and supported EHS management processes. The result is a system capable of ensuring compliance with requirements and effectively managing liability exposures, while reducing costs and managing the use of resources. Most companies that have achieved or set a goal of achieving this model have done so by carefully "mapping" what they want the system to do, comparing that map to the current system, identifying gaps and opportunities, evaluating options (including starting with a "clean slate") and planning a realistic transition, implementing the highest return elements first.




The Un-System
EHS Information Management
EHS Process Management
Total EHS Cost Indicator
EHS Information Management
EHS Process Management
The Info System
EHS Information Management
EHS Process Management
The Process System
EHS Information Management
EHS Process Management
The Dual Track System
EHS Information Management
EHS Process Management
The Integrated EHS Management System
EHS Information Management
EHS Process Management

Real Cost™ Analysis Tools—Applying them to EHS and Security Management
Cryovac Division, Sealed Air Corporation

In the spring of 2002, Kestrel completed a Real Cost™ and Business Contribution Analysis of Cryovac's largest facility, employing 1750 people. The analysis employed tools that Kestrel has developed and refined since the 1998 SOCMA Real Cost project, and will serve to create a model that can be employed at any of Cryovac's facilities, which range in size from 40 to 1750 employees.

There are only limited data to reveal the insights of full accounting of environmental, health and safety (EH&S) costs and benefits. Kestrel has developed tools to address this need, by supporting the evaluation of an enterprise's EHS efforts, and allowing for a benchmarking of the findings against industrial-sector baselines.

The cost factors typically missed, in traditional, conventional cost accounting for environmental, health and safety management, are many:

- Significant hidden costs - unallocated overhead, utilities, maintenance, legal, facilities, operating costs
- Unknown consequential costs - delays, emergencies, distractions, public opposition, permit denials, scuttled production plans
- Lost "Value" of pollution & unsafe work environment rarely quantified - raw material, energy, product lost via emissions, discharges, waste, labor inefficiencies, poor housekeeping

Real Cost™ Analysis normally shows a "Multiplier Effect" – organizations commonly spend from two to five times as much as is budgeted, recorded and labeled as "EHS" labor, operating expense and capital costs. Kestrel studies at several industrial facilities have found these factors can increase the effects of EHS real costs up to 20 times the initially perceived and recorded costs.

Kestrel's Real Cost™ Analysis tools include training materials, case studies, checklists, exercises, data-collection tools, spreadsheets, web-enabled summarization tools, process maps, flow-diagrams, model activities, work-breakdown structures, sample charts of accounts, lists of tasks/activities, steps and decision points, process maps, and summary graphics tools - - all of which interface with Kestrel's tools for process improvement and optimization.

Information from the Real Cost™ Analysis can help facility and corporate managers set priorities for system improvement in processes, equipment or practices.

Environmental, Health, and Safety (EH&S) Real Cost™ Analysis

Objectives:

- Measure the cost of EH&S activities at facility to gain a clear understanding of the current use of money and personnel to carry out EH&S functions.
- Assess the current contribution to business results from the EH&S function.

Environmental, Health, and Safety (EH&S) Real Cost™ Analysis

Objectives:

- Identify opportunities to reduce EH&S costs, improve the use of human resources, generate business flexibility, improve margins and minimize liability exposures.
- Assess opportunities for continual improvement and breakthrough change in keeping with the precepts of World Class Manufacturing.

Cost of EH&S Activities

Cost Category	% of Total Cost for Category (2001)	Total E&S Hours (2001)	Total EH&S Cost (2001)
Labor	6.14%	214,820	$5,927,320
Non-Labor Operating Costs	0.64%	N/A	$2,857,210
Capital Improvements	7.34%	N/A	$607,231

Labor Cost per Activity Group

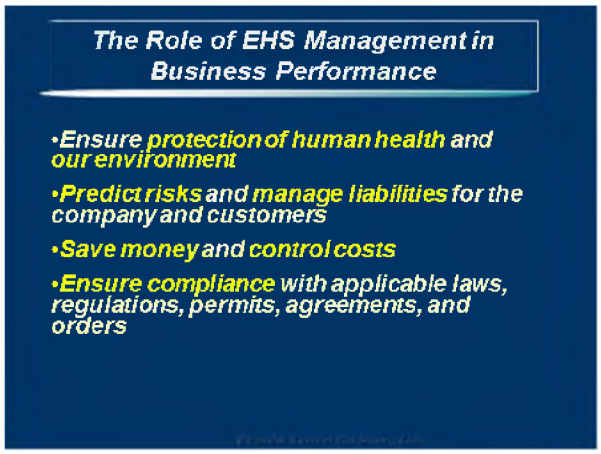
Activity Group	% of Total EH&S Labor (2001)	Total Hours for Activity Group (2001)	Total Cost for Activity Group (2001)
Training (Activity 1)	22.3%	47,867	$1,343,605
Planning and Procurement (Activities 2 and 6)	17.8%	38,150	$1,103,746
Permitting, Inspections, Recordkeeping and Analysis (Activities 3, 4 and 5)	22%	47,306	$1,403,259
Operations and Maintenance (Activity 7)	16.0%	34,340	$896,807
Waste Collection, Recycling and Disposal (Activities 8 and 9)	20.1%	43,170	$1,013,141
Customer and Public Relations (Activity 10)	0.5%	1,024	$40,061
Management Systems, Auditing and Regulatory Involvement (Activities 11, 12, 13 and 14)	1.4%	2,963	$126,701
TOTALS	**100%**	**214,820**	**$5,927,320**

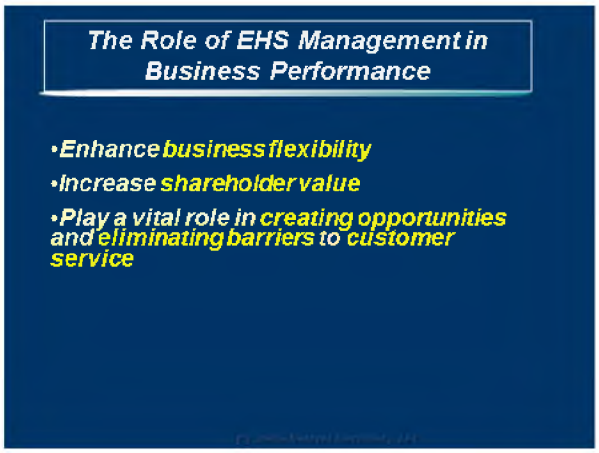
EH&S Labor Hours and Cost per Department

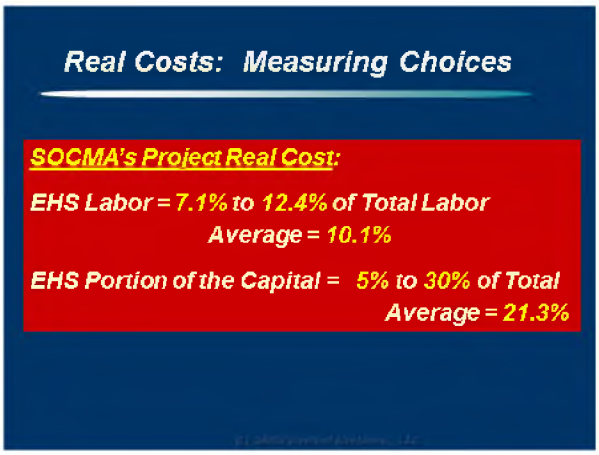
Department	% Total EH&S Labor (2001)	% of Total Employment (2001)	Total EH&S Hours (2001)	Total EH&S Cost (2001)	Total EH&S Hours per Employee
Production 1	10.4%	14%	22265	$644,092	83.1
Production 2	21.2%	20%	45596	$1,250,883	123.9
Production 3	17.3%	16%	37187	$1,004,181	122.3
Production 4	18.8%	18%	40298	$960,778	119.6
Production Support	2.3%	8%	4945	$144,045	34.1
Employee Development	11.9%	8%	25493	$787,735	160.3
Facility Operations	10.9%	4%	23404	$679,266	300.1
Accounting	0%	0%	46	$2,326	5.11
Logistics	3.6%	4%	7667	$220,939	100.9
TOTALS	96.4%	92%	206,901	$5,694,245	1049.41 (Average)

Management Team EH&S Hours and Cost

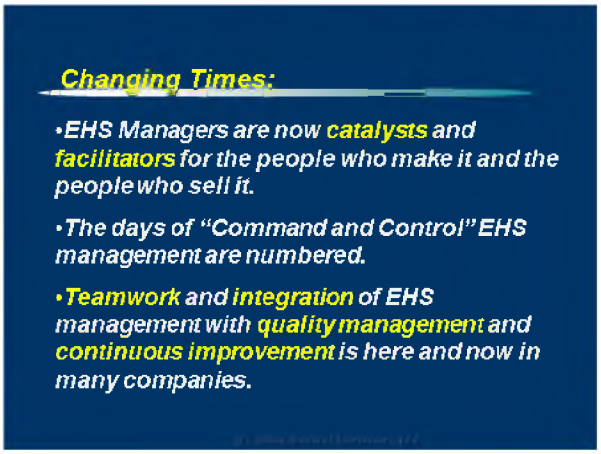
Activity Group	Total Activity Group Hours for Managers (2001)	Total Activity Group Cost for Managers (2001)	% of Total EH&S Cost for Managers (2001)	Activity Group Hours per Manager (2001)
Training	537	$34,438	2.6%	53.7
Planning and Procurement	189	$12,121	1.1%	18.9
Permitting, Inspection, Record-keeping and Analysis	573	$36,746	2.6%	57.3
Operations and Maintenance	10	$641	0.07%	1
Waste Collection, Recycling and Disposal	80	$5,130	0.51%	8
Customer and Public Relations	67	$4,297	10.7%	6.7
Management Systems, Audits and Regulatory Involvement	422	$27,063	21.4%	42.2
TOTALS	1,878	$120,436	39%	187.8 (Average)

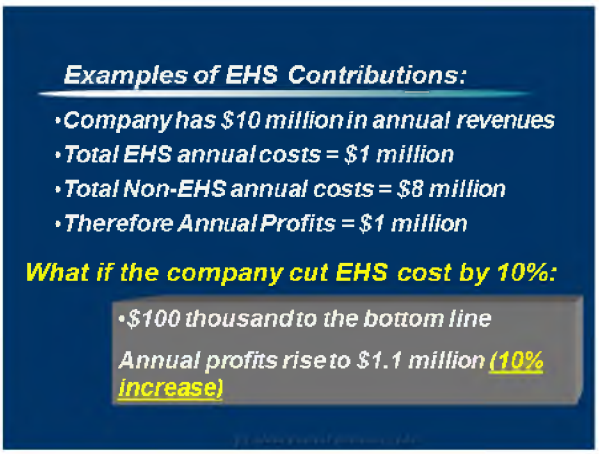

The Role of EHS Management in Business Performance
•Ensure protection of human health and our environment
•Predict risks and manage liabilities for the company and customers
•Save money and control costs
•Ensure compliance with applicable laws, regulations, permits, agreements, and orders

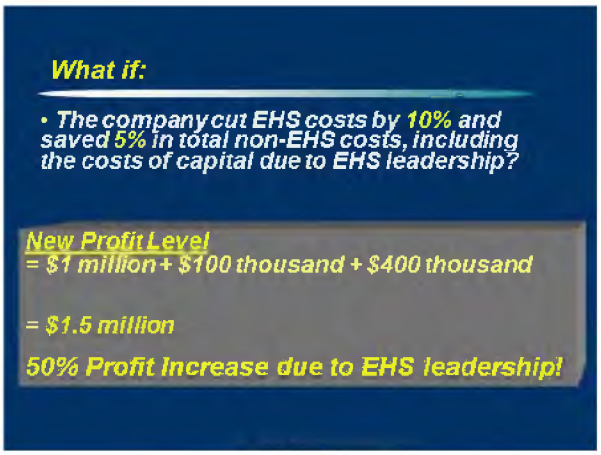

The Role of EHS Management in Business Performance
•Enhance business flexibility
•Increase shareholder value
•Play a vital role in creating opportunities and eliminating barriers to customer service

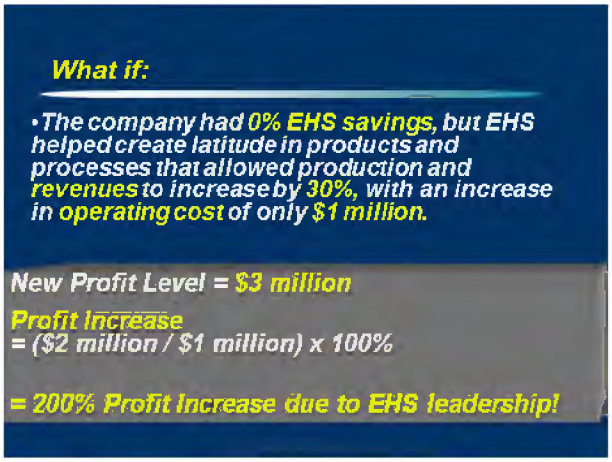

Real Costs: Measuring Choices
SOCMA's Project Real Cost:
EHS Labor = 7.1% to 12.4% of Total Labor
Average = 10.1%
EHS Portion of the Capital = 5% to 30% of Total
Average = 21.3%


Real Cost™ Conclusions
•Hidden costs handicap the manager by concealing the real costs and opportunities.
•Knowing the Real Costs enables the manager to develop choices and to improve business results.
•The Real Cost™ methods developed for SOCMA apply directly to EHS management, and can be readily adapted to management of energy, quality, and virtually all other focus elements of manufacturing.


Changing Times:
•EHS Managers are now catalysts and facilitators for the people who make it and the people who sell it.
•The days of "Command and Control" EHS management are numbered.
•Teamwork and integration of EHS management with quality management and continuous improvement is here and now in many companies.


Examples of EHS Contributions:
•Company has $10 million in annual revenues
•Total EHS annual costs = $1 million
•Total Non-EHS annual costs = $8 million
•Therefore Annual Profits = $1 million
What if the company cut EHS cost by 10%:
•$100 thousand to the bottom line
Annual profits rise to $1.1 million (10% increase)



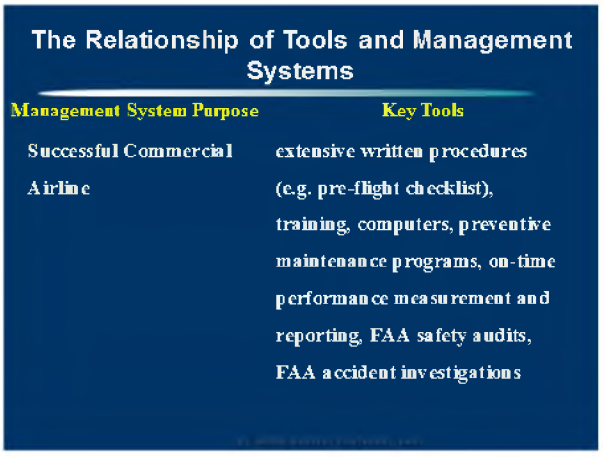


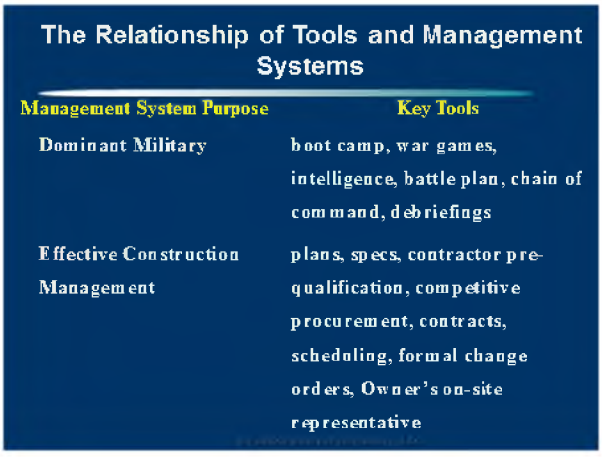
Environmental, Health, and Safety Management System Design Linking ISO 14001 and Responsible Care®

Served as senior system design consultant to an international manufacturing company for the design and implementation of an ISO-14000 compliant system that incorporates regulatory compliance management, the Management Practices of Responsible Care®, and business results improvement. Facilitated focus groups on the design of the management system concepts, including needs analysis, gap analysis, tool development and structure for the web-based information system to support the management system.

Kestrel employed the concepts that were developed in the SOCMA Responsible Care® Management System Software Development and Real Cost projects to design an environmental, health and safety management system for this flexible packaging company with 30 facilities worldwide. Cryovac had been a wholly owned subsidiary of WR Grace and Co. until a merger with Sealed Air Corporation. As a subsidiary of WR Grace, Cryovac subscribed to the principles and practices of Responsible Care®.

Cryovac was the alpha site for Kestrel's EH&S Navigator, which was Kestrel's first web-based management system tool designed to organize and link the many disparate pieces of information and special purpose tools. Kestrel assisted by leading a series of Management System design workshops and incorporating the decisions and outputs of the Cryovac design team into their Navigator. The process included questionnaires designed by Kestrel to enable plant managers and EH&S professionals to identify needs and priorities. One of the key objectives in the design on the Cryovac management system model has been to make the system scalable and useful to facilities of all sizes and types of operation.





Motivation for Planning

- Budget Preparation
- Regulatory Action
  - Enforcement
  - Criminal Prosecution
- New Developments
  - Regulations and Laws
  - Options Reduced or Eliminated
  - Technologies
- Plant Expansions and Modifications
- Acquisitions

Motivation for Planning (cont.)

- New Product Lines
- Management Focus / New Management
- Cost Increases
- Competitor Actions
- Risk Management / Reduction
- Image
- International Markets - ISO 9000 and ISO 14000 Certification

Environmental, Health and Safety Management Objectives

- Predict and control risks and costs for environmental, health, and safety management
- Maintain or create business flexibility
- Enhance Shareholder value
- Assure compliance with applicable laws, regulations, permits, agreements and orders

Benefits of Management System Approach

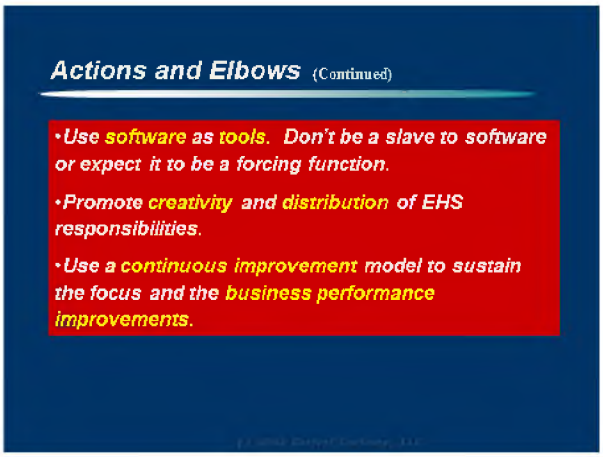
- Manage Risks
- Minimize Liabilities
- Assure / Improve Regulatory Compliance
- Reduce Costs
- Increase Productivity
- Gain New Business Opportunities
- Protect and Improve Shareholder Value
- Enhance Public Image

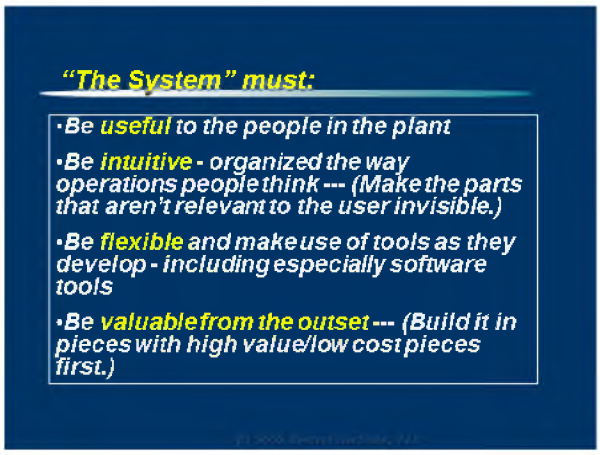
Optional Strategies for Environmental Compliance

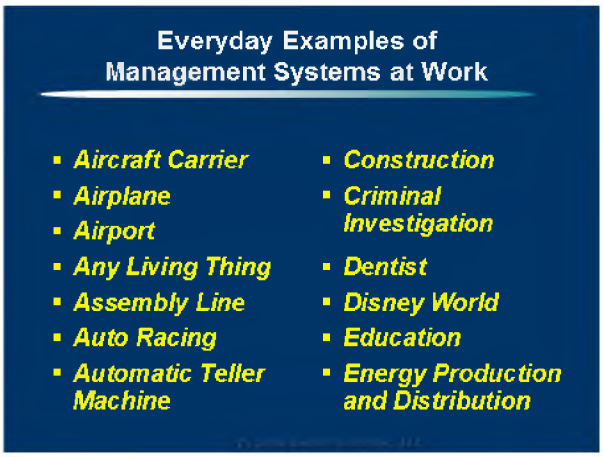
	Reactive	Responsive	Progressive
Outlook	0 to 1 Year	1 to 2 Years	2 to 20 Years
Motivation	Situational Respons to Enforcement	Compliance with Laws and Regulations	Ability to Predict and Control Events and Actions
Planning	None	Permits, Reports, Investigations and Other Near - Term Compliance Projects	Detailed Environmental Assurance Program
Implementation	Staffing to Meet Situation Needs	Staff / Resource Commitments to Meet Routine Monitoring and Compliance Needs	Staff / Resource Commitments to Carry Out Quality Assurance Program
Cost / Risk	Low Initial Cost / High Risk with High Liabilities	High Cost / Lower Risk with Lower Potential Liabilities	Highest Initial Cost / Lowest Risk with Limited Liabilities; Able to Allocate Resources by Priority

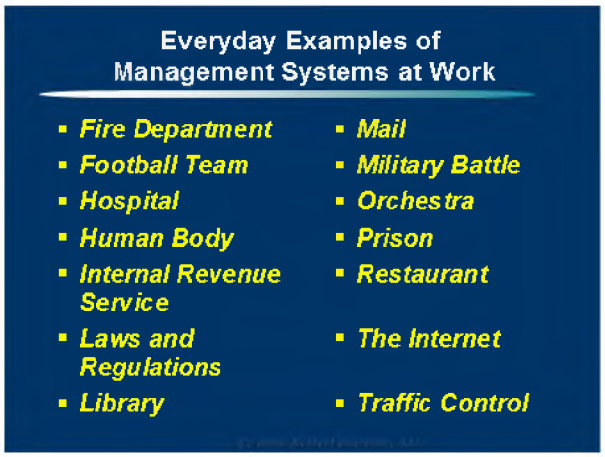
Actions and Elbows

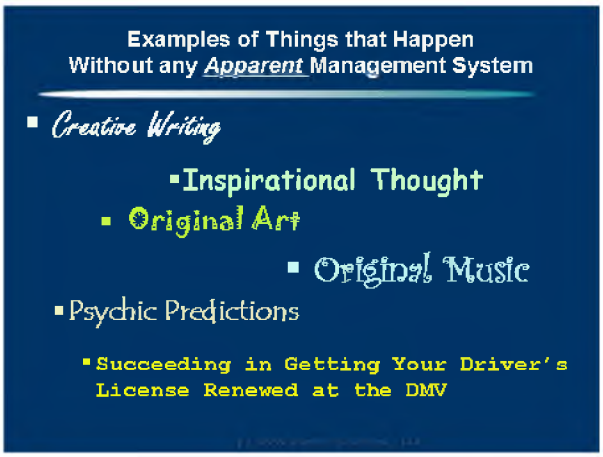
- *EHS staff need to learn about:*
  - *Customers needs/markets*
  - *Processes and products*
  - *Economics*
  - *People skills/teamwork*
  - *Decision management tools*
  - *"Thinking out of the box"*
- *Don't confuse motion with progress. Spend the time and resources to design the management system through teamwork.*

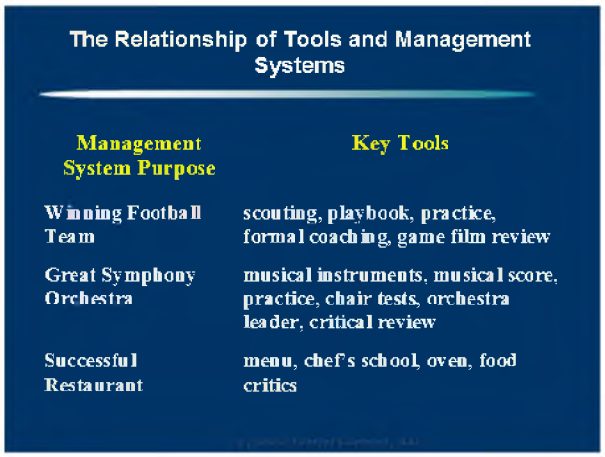

Actions and Elbows (Continued)
•Use software as tools. Don't be a slave to software or expect it to be a forcing function.
•Promote creativity and distribution of EHS responsibilities.
•Use a continuous improvement model to sustain the focus and the business performance improvements.

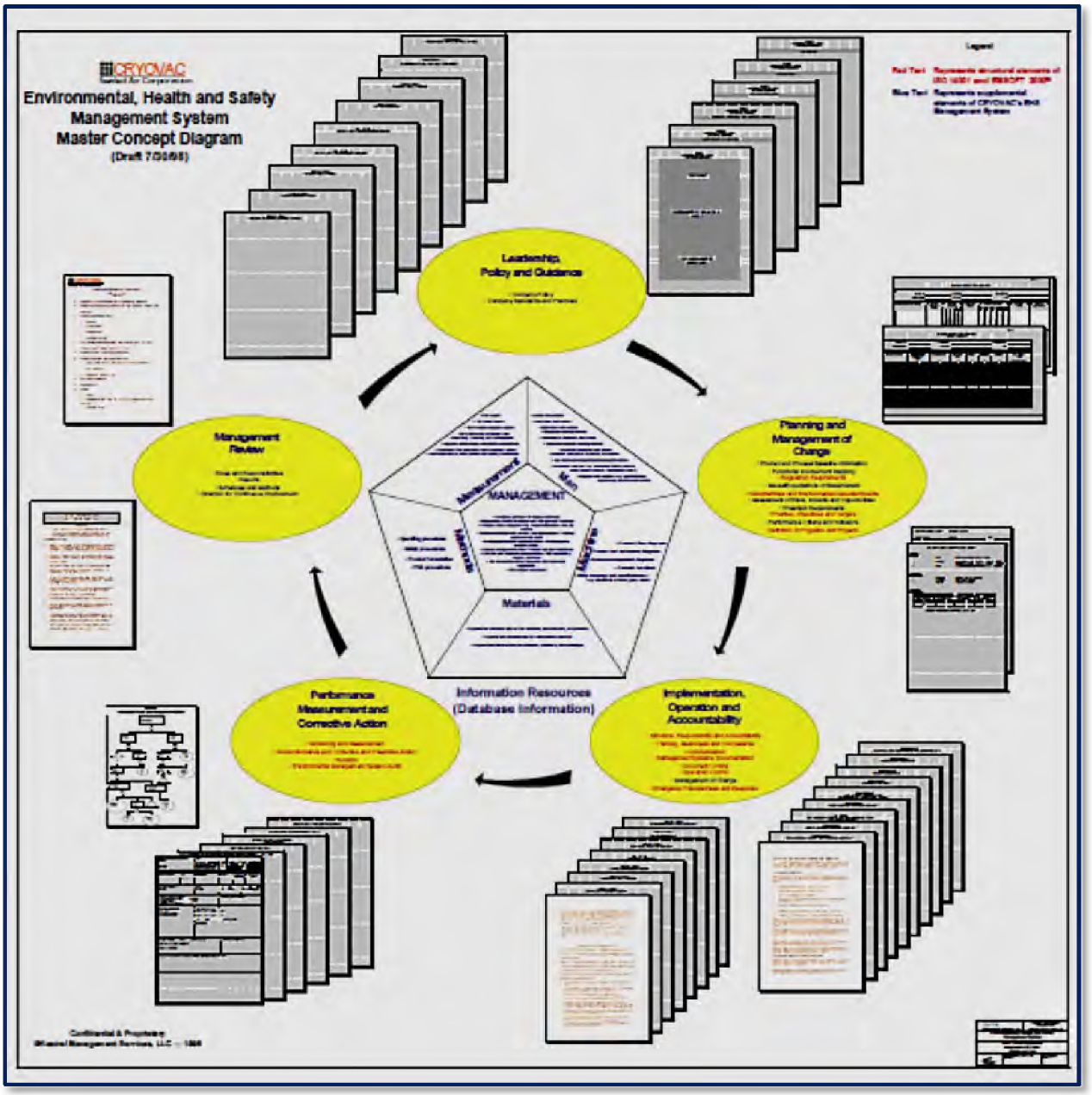

"The System" must:
•Be useful to the people in the plant
•Be intuitive - organized the way operations people think --- (Make the parts that aren't relevant to the user invisible.)
•Be flexible and make use of tools as they develop - including especially software tools
•Be valuable from the outset --- (Build it in pieces with high value/low cost pieces first.)


Everyday Examples of Management Systems at Work
Aircraft Carrier
Airplane
Airport
Any Living Thing
Assembly Line
Auto Racing
Automatic Teller Machine
Construction
Criminal Investigation
Dentist
Disney World
Education
Energy Production and Distribution


Everyday Examples of Management Systems at Work
Fire Department
Football Team
Hospital
Human Body
Internal Revenue Service
Laws and Regulations
Library
Mail
Military Battle
Orchestra
Prison
Restaurant
The Internet
Traffic Control


Examples of Things that Happen Without any Apparent Management System
Creative Writing
Inspirational Thought
Original Art
Original Music
Psychic Predictions
Succeeding in Getting Your Driver's License Renewed at the DMV


The Relationship of Tools and Management Systems
Management System Purpose
Key Tools
Winning Football Team
scouting, playbook, practice, formal coaching, game film review
Great Symphony Orchestra
musical instruments, musical score, practice, chair tests, orchestra leader, critical review
Successful Restaurant
menu, chef's school, oven, food critics


CRYOVAC
Environmental, Health and Safety
Management System
Master Concept Diagram
(Draft 7/08/98)
Leadership, Policy and Guidance
Planning and Management of Change
Implementation, Operation and Accountability
Performance Measurement and Corrective Action
Management Review
MANAGEMENT
Measurement
Materials
Machine
Man
Materials
Information Resources
(Database Information)

Restoration of 95 Year-Old Historic Schoolhouse

Locust Hill School

Est. 1923

5495 **Locust Hill Road**

(Highway 290 just east of the intersection of Highway 290 and Tigerville Road - between Travelers Rest and Greer)

April 2013, before purchase by Sparrow Hawk, LLC.

April 2015.

The Restoration Story

Sparrow Hawk, LLC, owned by Gail Stephens of Travelers Rest, South Carolina, purchased the Locust Hill School property in April 2013. The initial plan was to restore the schoolhouse building for Kestrel Horizons, LLC as primary tenant. Kestrel Horizons was one of the Southeast's finest small engineering and environmental science consulting firms and operated from April 1998 through October 2014. Kestrel was owned by Gail and Bill Stephens.

Between April 2013 and July 2014, plans for the schoolhouse changed a few times. Plans to grow and change Kestrel Horizons evolved towards allowing the sun to set on Kestrel and beginning new initiatives and adventures. All the while, the vision of restoring the schoolhouse to its original elegance remained constant.

Something else happened along the way. We found that the phrase *"they don't build 'em like they used to"* took on a different meaning. The original construction was not anywhere close to meeting 2012 International Building Codes. In fact, demolition and "salvage" activities by previous owners and midnight visitors had made the building truly unsafe. Scary unsafe. Unsafe by 1921 standards as well as current standards.

So the first task was to make the building safe enough to work in. Emergency repairs included temporary structures as well as construction which would become part of the permanent restoration. We spent the first eight months – mostly working weekends so we could hand-pick the carpenters and helpers – stabilizing the structure. While the folks at Tractor Supply and Northern Tool were unaware, we were purchasing various heavy duty cables, jacks, bars, ratchets, and hitches that were used in ways that would have been considered "conventional" a century or more ago.

Photo on left is the view from the "third floor" platform among the trusses. The large steel three point tractor hitch parts are holding the broken truss together. They were used to crank the trusses together and pull in the walls as the roof peak was raised. Got the concept of lift and pull in at the same time from watching a circus tent being raised when I was about ten years old. Didn't have any elephants handy, so we used tractor parts. Not in any construction handbook.

Photo on right shows temporary posts to support platform. Large column supports help raise the roof and bring walls to vertical. All were removed to create a 3,500 square foot auditorium with 50 foot free span timber trusses.

Center 12" x 12" columns helped support the roof until everything was tightened. These are "the center poles of the circus tent".

While we worked to stabilize the building, something else happened: "restoring and repurposing" the schoolhouse became "preserving and renewing the life" of the schoolhouse. To do that, we had to create a modern - and much stronger - structural framework within the schoolhouse in a way that would be virtually invisible – or at least unobtrusive.

The structural and exterior restoration and reconstruction of the landmark building is now nearly complete, and the response from the community to the two year transformation has been remarkable. People routinely slow down from 50 mph as they pass to get a good look. Many turn in and sit out front, waiting to be invited in. We are now able to let folks inside to take a tour and share their stories of personal and family connections and experiences there. All are astounded at the second floor – originally the auditorium with a twelve foot ceiling, and now a space that invariably gets the same initial reaction: "Wow!"

Q&Amy: Former Locust Hill School gets massive renovation

Amy Clarke Burns
aburns@greenvillenews.com
Columnist

Q: I've watched an old, abandoned schoolhouse on Locust Hill Road be slowly and quietly restored over the past few years. What's the history of this building, and what are the plans for it now?

Amy in short: The former Locust Hill School, nearly crumbling on itself two years ago, has been diligently restored by a local engineer, who is now putting the building up for sale.

A bit more: The two-story, square building was built in 1923 north of Travelers Rest. It served as a schoolhouse for 40 years. Since then it has passed through the hands of several owners, serving at times as a private residence and place of worship.

It was nearly obscured from the road by overgrown vegetation when Bill Stephens drove by one day in early 2013 and saw a "for sale" sign and an open front door. He walked in and found broken ceiling trusses, missing joists, a sagging roof, splayed walls.

"Frankly it was scary because there were so many broken structural members," he said. "It was nearly beyond saving."

Stephens, who then owned environmental engineering and science firm Kestrel Horizons, envisioned a restored building that could serve as the home for his business.

HEIDI HEILBRUNN/STAFF

Bill Stephens and his wife, Gail, owners of the former Locust Hill School, have renovated the building.

His wife, Gail, officially bought the building and its 3.7 acres in April 2013 for $173,000, according to county property records.

The past two years have been spent steadily restoring the schoolhouse, remaining faithful to its 90-year history while also meeting modern building standards.

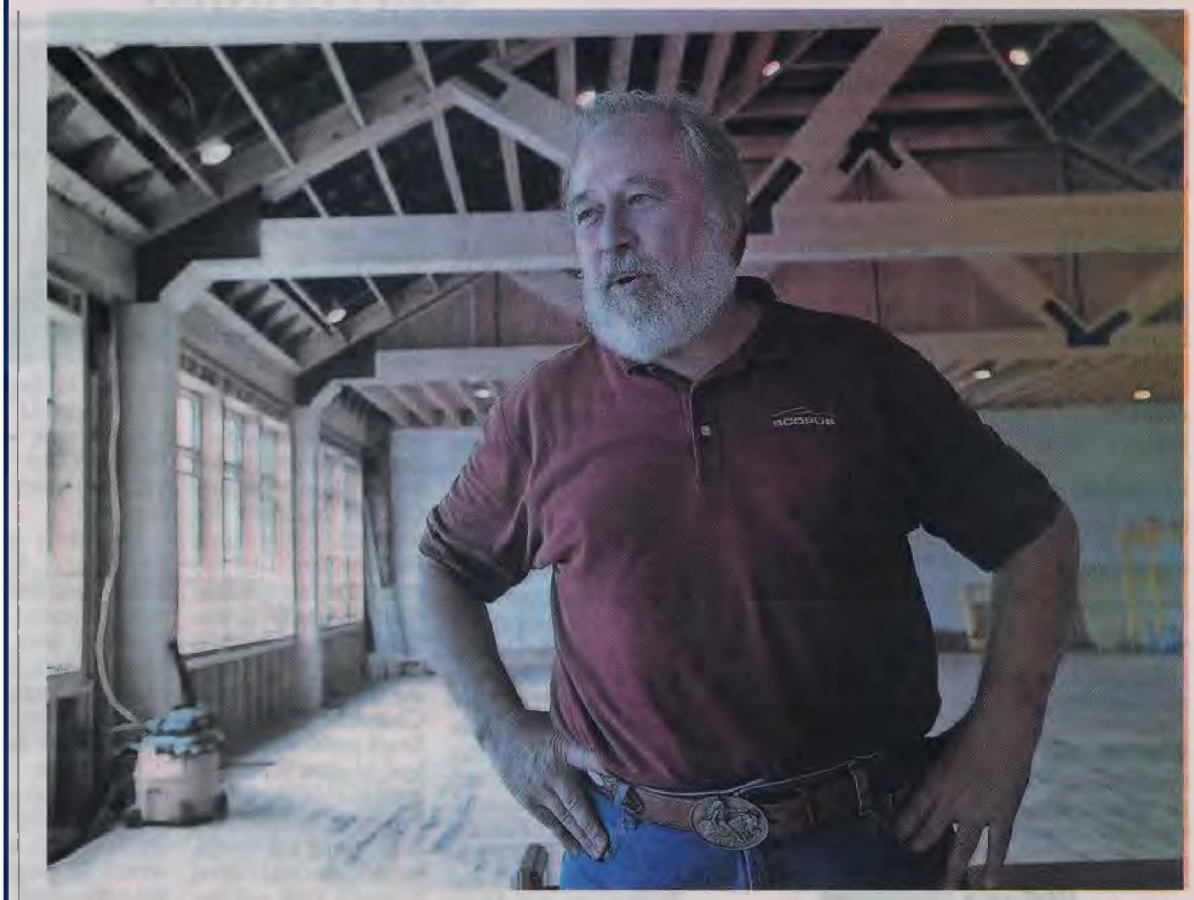
"I would not allow any manufactured beams or anything. It was all built with timber the way it would have been back then," Stephens said. "Rods, jacks, levers — the old-fashioned means of building buildings from 100 years ago, we had to use those same methods again."

It took about $100,000 and at least six months just to get the building stabilized, he said.

"I've always liked challenges that maybe somebody else would pass up, things that most other people would say only a fool would do," he said.

The 7,580-square-foot building is simple in design: four rooms on the first floor (one of them still painted with the lines of an indoor basketball court), a center staircase leading to an open second floor, which served as an auditorium for the school as well as a gathering place for Christmas pageants, community socials and Saturday-night roller skating.

See Q&AMY, Page 5A



HEIDI HEILBRUNN/STAFF/

Bill Stephens and his wife Gail, owners of the former Locust Hill School, have renovated the building.

Q&Amy

Continued from Page 3A

Despite its derelict state, some parts of the building were still in reasonably good shape in 2013. The wood floors — red oak, white oak and heart pine — were all original; the windows were almost completely intact; the stage remained in place on the second floor.

The restoration work has involved replacing the windows with massive modern versions, shoring up cracked and bowed wall studs, sanding and repairing wood floors, and repairing or replacing crumbling concrete. Stephens also removed the ceiling in the second floor to create a soaring 25-foot cathedral ceiling with exposed beams.

Last year, Stephens decided to close Kestrel Horizons, and he and Gail now have the restored school on the market for $785,000.

Some final work, including installing bathrooms and HVAC, will be completed after the sale, so the new owner can make layout and design decisions.

State Rep. Mike Burns, who represents the area, said he's toyed with the idea of purchasing it himself. His father attended school there in the 1930s; his grandmother worked in the cafeteria that served students hot lunches.

"It is an icon in the community that has not been used for anything purposeful for almost a generation," he said.

The building would make a great home, he said, for shops, offices, even a restaurant. The success of the nearby Hungry Drover restaurant, he said, proves even out-of-the-way destinations can thrive with some character.

"I think that's the kind of vision that might take off," he said.

The Stephenses are holding an open house and "reveal" on July 4 and 5. Former students and their families, former workers, and community members are invited to explore the restored building at 5495 Locust Hill Road.

"I'd say 100 years from now, it'll be in a lot better shape than it was when we found it," Stephens said.

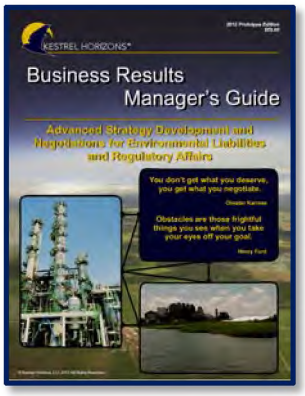
Got a question? Send it to Q&Amy by emailing me at aburns@greenvillenews.com or calling 864-298-3822. You can find me on Twitter at @QandAmyNews.

PRESENTATIONS AND PAPERS (Partial List)

- *"Cutting the Cost of Disposal through Innovative and Constructive Uses of Foundry Wastes"* by W.A. Stephens and T.P. Kunes. Published in the *Transactions of The American Foundrymen's Society* Volume 89, 1981.
- *"Making Your Foundry's Waste Work for You: Constructive Use and Reclamation." By M. E. Smith, W. A. Stephens, and T. P. Kunes. Published in Modern Casting magazine. 1982.*
- *"Case Studies in Constructive Use of Foundry Waste for Landfill Construction." By W. A. Stephens, K. E. Martin. Presented at the 9th Annual Madison Waste Conference, September 9-10, pp. 178-203. 1986.*
- *"Waste Minimization Options for the Ferrous Foundry Industry" by W. A. Stephens, D. F. Oman, and T. R. Stolzenburg. RMT, Inc. Madison, Wisconsin. 1988.*
- *"Picking Up* the *Pieces: The Aqua Tech / Groce Laboratories Cleanup*" by William A. Stephens, Paul A. Furtick and David M. Comen. Published in *Network* by RMT, Inc. August 1993 and presented at the Annual Environmental Conference of the Greenville Chamber of Commerce, November 1993.
- *"Success Strategies for CERCLA Litigation and PRP Actions*" by William A. Stephens. Presented at the Seventh Annual Environmental Litigation Midyear Meeting of the American Bar Association, Steamboat Springs, CO, February 1995.
- *"Project Real Cost™"* Presented by William A. Stephens at the SOCMA Annual Business Meeting, May 1998 [no paper]
- *"Environmental, Health and Safety Management-Real Costs, Choices, Control and Business Results" presented* by William A. Stephens at the 1999 Upstate Environmental Roundtable, Greenville, SC, August 1999. [no paper]
- *"Managing Environmental Liabilities for Beneficial Reuse"* by William A. Stephens, Thomas W. Devine and Vincent Atriano. Published in Modern Casting magazine, April 2002
- *"Major Recent Federal Ruling an Superfund Liability for Constructive Use of Foundry Wastes*" presented by William A. Stephens and Vincent Atriano at the American Foundry Society Congress, May 2002 [No paper – selected as Best Presentation]

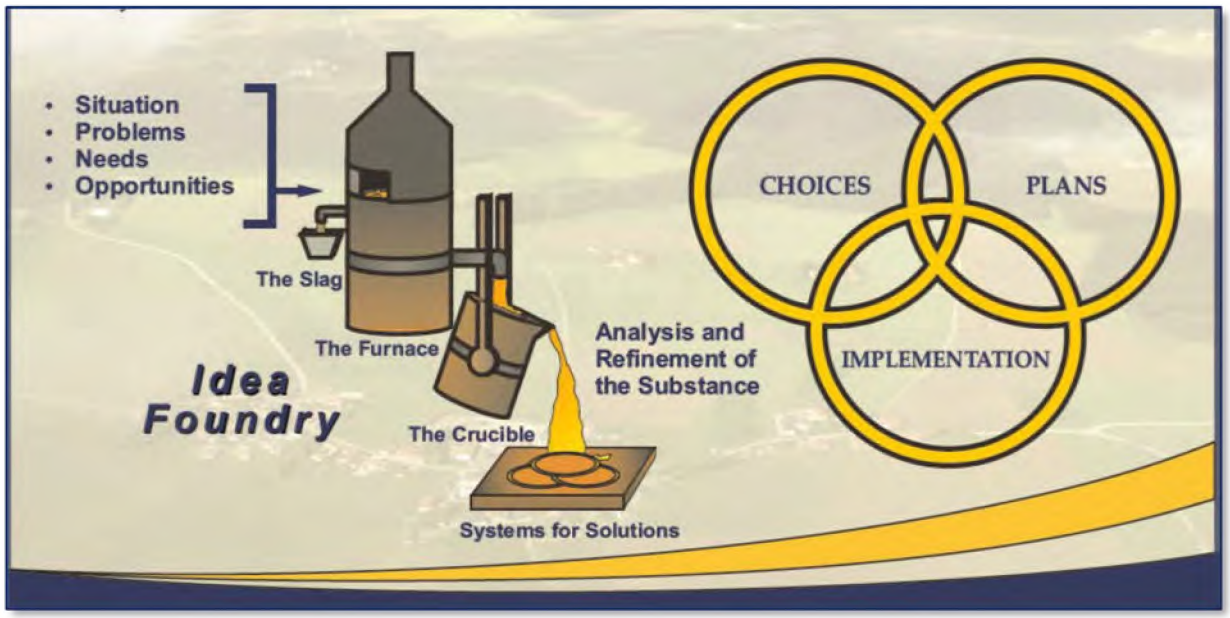
Bill continues to author The Managers' Guide series he began in 2000. Topics include:

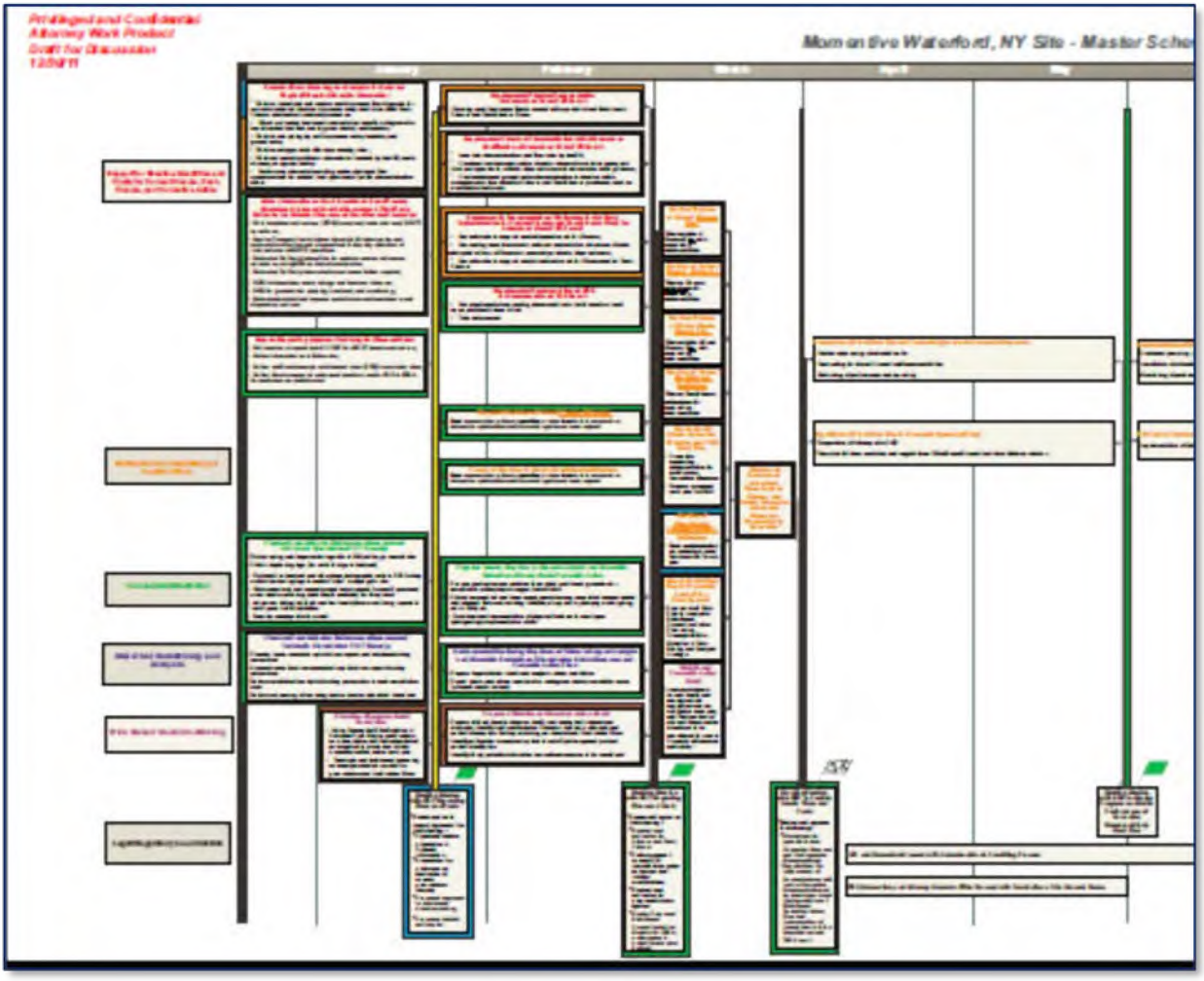
- *Advanced Management Strategies, Team Dynamics, and Negotiations*
- *Metals in the Environment*
- *RCRA Corrective Action*
- *Constructive Use of Secondary Materials*
- *Coal Combustion Resource Management*
- *CERCLA Cost Recovery Actions*
- *Multimedia Environmental Management Approaches: Up the Pipes*
- *Next-Generation EHS Audits and Triage*

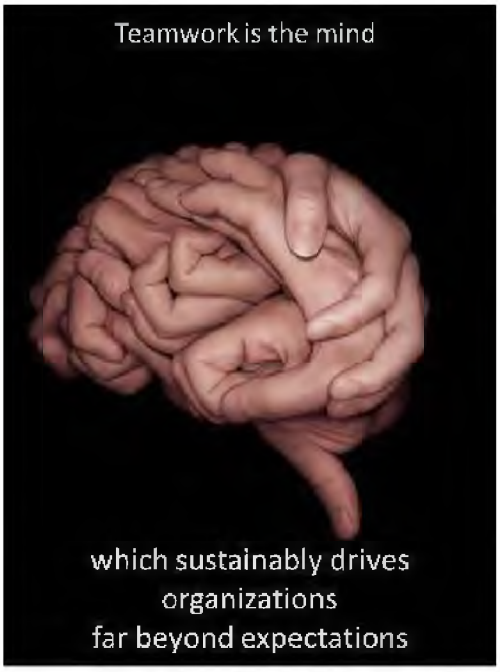


1977 2000 2011

Bill Stephens

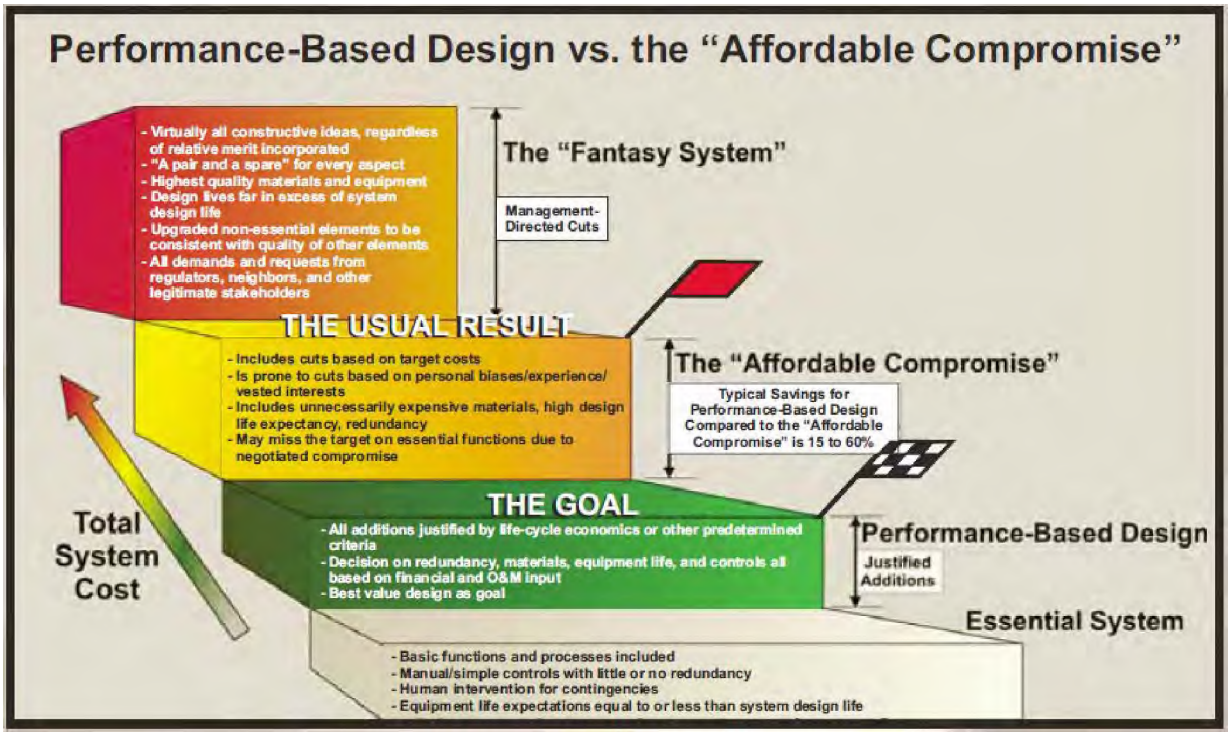


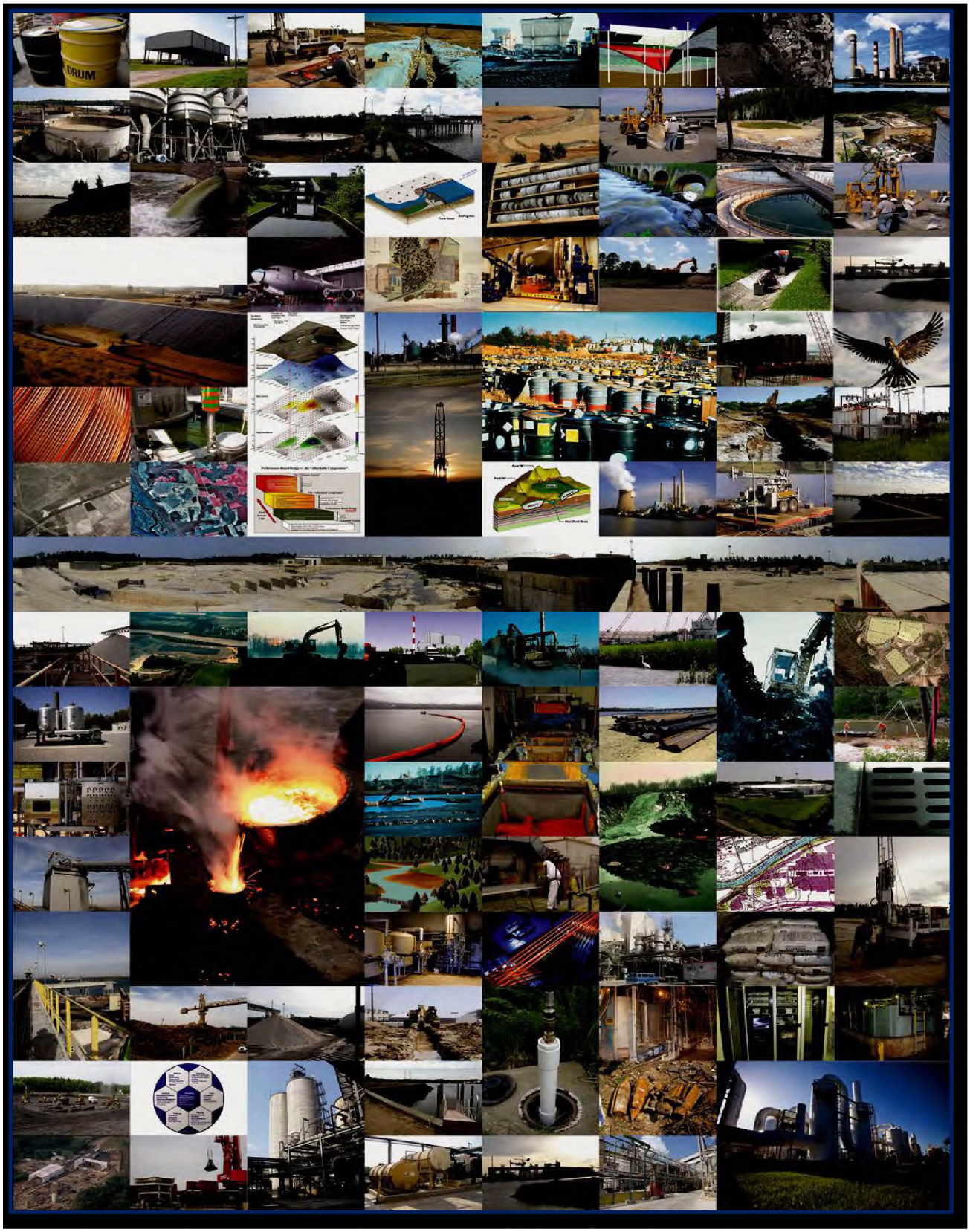



Teamwork is the mind
which sustainably drives
organizations
far beyond expectations


Industrial Mission Support
for Growth, Change, and Performance
Introducing Kestrel's alliance partner
Scopus Security Solutions
"Hiring Kestrel is like catching lightning in a bottle. I'm sure glad you're on our side."
- Kestrel Client
Manufacturing and heavy industrial companies face larger domestic and international challenges today than during almost any other time in history. At the same time, companies that operate under sound and aggressive strategic business plans have extraordinary opportunities to take advantage of dramatic developments in the marketplace. Bankruptcies and downsizing of competitors, robust availability of skilled labor in some areas of the country, and divestiture activities of companies shedding non-core assets provide opportunities for production capacity growth, expansion of product lines, and extraordinary profit increases.
Strong companies are also seeking stronger performance, as they always will. With the tide having gone out and stayed out for several years, many companies are taking advantage of the opportunity to build and improve the fleet and to launch expeditions.
Kestrel serves companies actively pursuing growth, aggressive management of change, and business performance improvement. We assist with the mission support functions of environmental as well as business risk and continuity management.
This booklet describes Kestrel's mission support services in the following areas:
Business Growth and Focus
Planning and Management of Change
Operations Management
Corporate Culture Development and Sustainment
Liability Exposure Management and Performance Assurance
Business Continuity and Adaptability
KESTREL HORIZONS™
SCOPUS
Kestrel 4.0 / Scopus Security Solutions
Growth, Change, and Performance Services


With so many processes and information either already documented or needing to be documented, how are Absolutes and Considerations determined? The best means of determination is by following the common "HW5" approach.
Who?
Facility Staff
Consultants, Contractors, and Suppliers
Corporate Staff
Roles and Responsibilities
Training Records
Where?
Aerial Photography
Archives and Records
GIS and CAD Layers
Maps and Drawings
Site-Related Records
Who?
Where?
How?
Compliance Plans
Engineering Plans
Performance Measurement
Procedures
Procurement of Outside Services Programs
Qualification and Performance
Routine Testing & Monitoring
Studies and Analysis
Treatment, Storage, Disposal and Recycling Facilities
Why?
When?
What?
Why?
Issues and Perspectives
Laws and Regulations
Permits and Agreements
Policies and Standards
When?
Compliance Calendar
Project Schedule
Reporting Schedule
What?
Archive Reports
Buildings
Contracts
Environmental Management
Materials and Supplies
Performance Metrics
Priorities, Objectives, and Targets
Solid and Hazardous Wastes
Utilities and Communications
Water Supply
Water Treatment and Discharge


Performance-Based Design vs. the "Affordable Compromise"
- Virtually all constructive ideas, regardless of relative merit incorporated
- "A pair and a spare" for every aspect
- Highest quality materials and equipment
- Design lives far in excess of system design life
- Upgraded non-essential elements to be consistent with quality of other elements
- All demands and requests from regulators, neighbors, and other legitimate stakeholders
The "Fantasy System"
Management-Directed Cuts
THE USUAL RESULT
- Includes cuts based on target costs
- Is prone to cuts based on personal biases/experience/ vested interests
- Includes unnecessarily expensive materials, high design life expectancy, redundancy
- May miss the target on essential functions due to negotiated compromise
The "Affordable Compromise"
Typical Savings for Performance-Based Design Compared to the "Affordable Compromise" is 15 to 60%
THE GOAL
- All additions justified by life-cycle economics or other predetermined criteria
- Decision on redundancy, materials, equipment life, and controls all based on financial and O&M input
- Best value design as goal
Performance-Based Design
Justified Additions
Total System Cost
Essential System
- Basic functions and processes included
- Manual/simple controls with little or no redundancy
- Human intervention for contingencies
- Equipment life expectations equal to or less than system design life


DRUM