

Remediation:
Partnering Opportunities
are Often Overlooked



AHMP 2016 National Conference

Washington, DC

August 29th, 2016

1743 HOLDINGS, LLC

David Levandoski, CHMM

Tripp Fischer, P.E.

tfischer@bstiweb.com

Why we are here:

- Discuss the dynamics of business partners
- Fighting mediocracy (or worse)
- Past experiences
- Provoke thought and dialog
- To show a good example of partnering

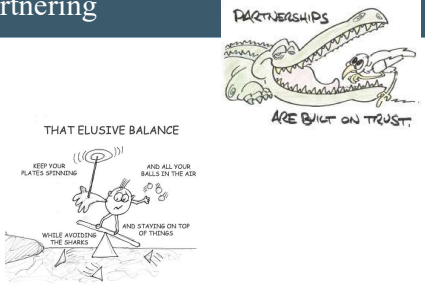


"I've never worked with a consultant.
Are you going to hypnotize me first?"

Why this works for you:	Why this works for us:
<ul style="list-style-type: none">• Open communication• Energize new ways to approach old (or new) challenges• Efficiency (time and money)• Looks good	<ul style="list-style-type: none">• More data• Better decisions• Care for equipment• Good business• Looks good

Rules for Partnering

- Trust
- Perspective
- Transparency
- Balance



Partnering Opportunities

- Remediation system monitoring
- Environmental monitoring
- Heavy equipment and labor
- Site knowledge
- Permitting
- Scientific analysis



Get a Good Break Out of the Gate

- Ask for references
- Open dialog and meet
- Discuss capabilities of all parties including regulatory
- Shop people not price... then talk price
- Give your perspective and make it personal



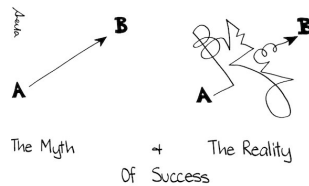
Planning Stages

- Establish baseline goals
 - Regulatory requirements
 - Reporting requirements
 - Endpoints
- Outline costs categories
 - Capital costs
 - Labor
 - Equipment
- Evaluate partnering ideas and benefits
 - Data Collection
- Clearly define roles (in writing)

TASK	DESCRIPTION	CAPITAL COSTS	Operating Costs			
			Year 1	Year 2	Year 3	Year 4
1	Initial System Design	\$12,000,000	\$0	\$0	\$0	\$0
2	Design and Construction	\$2,000,000	\$0	\$0	\$0	\$0
3	Construction and Installation	\$5,000,000	\$0	\$0	\$0	\$0
4	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
5	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
6	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
7	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
8	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
9	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
10	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
11	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
12	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
13	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
14	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
15	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
16	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
17	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
18	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
19	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
20	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
21	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
22	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
23	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
24	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
25	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
26	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
27	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
28	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
29	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
30	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
31	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
32	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
33	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
34	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
35	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
36	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
37	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
38	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
39	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
40	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
41	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
42	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
43	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
44	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
45	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
46	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
47	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
48	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
49	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
50	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
51	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
52	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
53	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
54	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
55	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
56	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
57	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
58	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
59	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
60	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
61	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
62	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
63	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
64	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
65	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
66	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
67	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
68	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
69	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
70	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
71	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
72	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
73	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
74	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
75	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
76	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
77	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
78	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
79	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
80	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
81	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
82	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
83	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
84	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
85	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
86	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
87	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
88	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
89	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
90	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
91	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
92	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
93	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
94	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
95	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
96	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
97	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
98	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
99	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0
100	Construction and Installation	\$1,000,000	\$0	\$0	\$0	\$0

Evaluate – Reevaluate – Adapt – Succeed

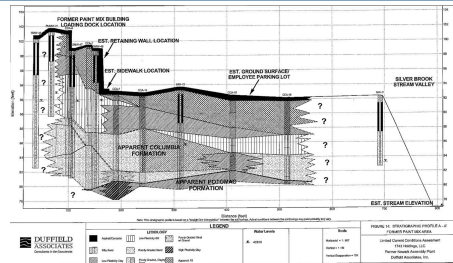
- Routine performance meetings
- Ask questions
- Provide balanced input
- Provide feedback
- Be appreciative if deserved



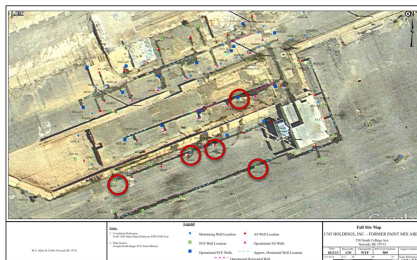
Case Study # 1 – Newark, DE



Case Study # 1 – Newark, DE

[illegible]

Case Study # 1 – Newark, DE

[illegible]

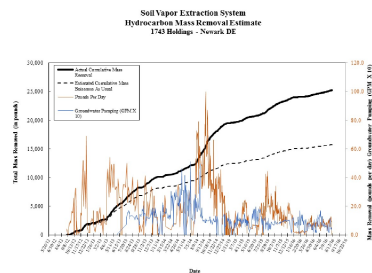
Cost Benefit Analysis

Table 1 - Estimated Costs - Interim Remedial Action Year 2 (AS/SVE System)					
TASK	DESCRIPTION	Business As Usual	Business As Usual With Long Term Dual Phase Trial	Reduced O&M With Long Term Dual Phase Trial	Reduced O&M With Full Scale Dual Phase
1	Annual System O&M	\$75,500	\$75,500	\$68,076	\$68,076
2	AS/SVE Remediation Equipment Usage	\$64,200	\$64,200	\$64,200	\$64,200
3	Inventorying	\$0	\$11,559	\$11,559	\$56,918
Projected Operation Cost		\$139,700	\$153,259	\$133,835	\$181,194
Original Projected Budget		\$135,682	\$135,682	\$135,682	\$135,682
Budget Surplus/Deficit		-\$4,018	-\$15,577	-\$153	-\$45,512
Predicted Mass Removal (lb)		5,712	6,807	6,807	9,454
Cost per lb Removed		\$68.75	\$59.29	\$57.12	\$44.98

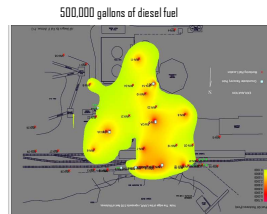
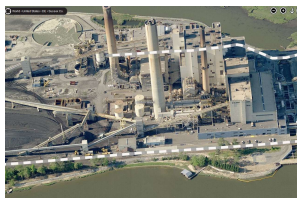
Results of Groundwater Pumping

TASK	DESCRIPTION	Business As Usual	Business As Usual With Long Term Dual Phase Trial	Actual Year 2	Notes
Projected Operation Cost		\$139,700	\$151,259	\$151,259	BSTI original Costs plus pumps, install, support
Original Projected Budget		\$135,482	\$135,482	\$135,482	
Budget Surplus/Deficit		-\$4,918	-\$15,577	-\$15,577	Estimated value of T743 training solutions - \$108,000
Predicted Mass Removal (lb)		5,712	6,807	6,740	Includes GW mass-out LNAPL
Cost per lb Removed		\$68.75	\$59.39	\$59.86	\$87/lb factoring in training costs

- Over 26,036 lbs. removed as of August 2016
- 420 pounds of product
- 380 pounds VOCs in the dissolved phase
- No partnering = 15,760 lb (10.276 pounds less) or only 60% of actual
- Down time: approximately 60 days (96% up time)
- Estimated down time without partnering: 218 days (85% up time)
- Total of 34 System shutdowns due to: weather, power outages, equipment failure or maintenance, sampling
- Only 5 required consultant intervention (equipment issues)



Case Study # 2 – Millsboro, DE



Case Study # 2 – Millsboro, DE



Partnering Solutions

Results

- | | |
|---|---|
| <ul style="list-style-type: none"> • Daily data (water pumping) • Product recovery readings • Daily site inspections • Chemical injections for biofouling • Coordination with plant (safety) • Shipping and receiving • Laboratory • Facility resources (wastewater, reuse) • Mechanical adjustments on pumps • Filter cleaning | <ul style="list-style-type: none"> • 99% uptime over 14 years • Immediate response to maintenance issues • Reduced O&M costs - @ \$120k annually • Direct delivery and installation of parts • Site knowledge - less reconnaissance • Reuse of 280k of fuel • Reduced laboratory costs • No health and safety violations • Increased communication |
|---|---|

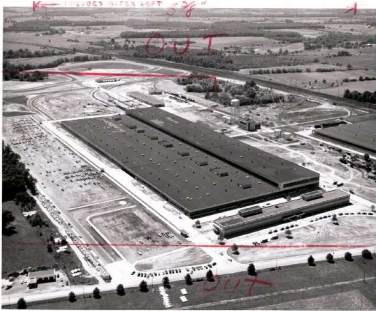
Additional Examples

- Risk communication and indoor air sampling at a manufacturing company
- Using physical labor and equipment to implement best management practices for storm water for agricultural setting
- Use of public municipality resources (equipment, boats, labor)
- Best management practices and guidance documents, training
- Oil recovery at a large car rental facility

1743 HOLDINGS, LLC

"Advantages of Teaming Up With Your Consultant"

1743 HOLDINGS, LLC



1743 HOLDINGS, LLC



1743 HOLDINGS, LLC



1743 HOLDINGS, LLC





The University of Delaware's Science, Technology and Advanced Research (STAR) Campus has the unique opportunity to be a center of innovation, leading cutting-edge research in areas such as health science, cyber security, engineering and alternative energy. STAR's direct proximity to Delaware's flagship university allows the research campus to maximize UD's unique resources and partnerships with government agencies and private businesses. In addition to providing priceless educational and professional opportunities for students, STAR campus will ignite job and economic growth in Delaware for years to come.

1743 HOLDINGS, LLC**University of Delaware Demographics**

- Main Campus: Newark, DE
- Established 1743, Chartered 1833
- First Study Abroad Program
- 23,000 students. 19,500 undergrads / 3,500 graduate students
- Carnegie Mellon High Research Institution: ~ \$200 MM
- #1 Physical Therapy program in the nation (US News)
- #9 Chemical Engineering Graduate Studies in the nation (US News)
- \$1.0 Billion annual budget
- Land Grant, Sea Grant and Space Grant University
- 2009 Purchased Chrysler Automobile Assembly Plant (272 Acres) / 1743 Holdings, LLC established
- Centrally located between New York City and Washington DC

1743 HOLDINGS, LLC**Professional Background**

- BS Chemical Engineer
- Worked at Rocky Mountain Arsenal and other NPL Superfund Sites
- Environmental Engineer / Project Manager at the University of Delaware (28+ years)

Quick Demolition Project Facts

- Start to Completion – 13 months
- 4 Million Square Feet Demolished
- 90+% Recycling Rate
- 140 Million Pounds of Ferrous Scrap Steel Recycled
- 3.8 Million Pounds of Copper, Stainless Steel & Aluminum Recycled
- 150,000 tons of concrete recycled
- 40,000 Light Bulbs recycled
- 379 Tons Asbestos Containing Materials Abated

1743 HOLDINGS, LLC

Soil Vapor Extraction / Air Sparge System



1743 HOLDINGS, LLC

Soil Vapor Extraction / Air Sparge System



Unique Project Facts That Made Teaming Up a “Win – Win” Situation

- 2.5 Acre Area of Contamination
- Meet Project Goals while managing Tight Budget Constraints (Driving Factor)
- Change in hydrology following demolition
- Relationship (Most Important Factor)
- Resources (Works both ways!)
- Permitting
- Trust
- System Maintenance
- This is just one example. There are many opportunities to team up if the situation is right
