Rec'd 5/2/14
Code 113

GONZALEZ
SAGGIO
HARLAN

May 1, 2014

Ms. Nancy Ryan
Wisconsin Department of Natural Resources
2300 North Dr. Martin Luther King, Jr. Drive
Milwaukee WI, 53212

Re: Consultant Selection; Former Express Cleaners; 3941 North Main Street, Racine, Wisconsin
BRRTS Number 02-52-547631

Dear Ms. Ryan:

The Ehrlich Family Limited Partnership (EFLP) has obtained and reviewed three proposals to conduct remedial activities at the above-referenced site, and the adjacent property located at 2936 North Bay Drive in Racine. The adjacent property was purchased and is now owned by the EFLP. Proposals were obtained from Stantec, Geosyntec and Environmental Resources Management (ERM). Our records show that you received a copy of each proposal directly from the authors. Pertinent information about each of the proposals is summarized in Table 1 (enclosed).

It is our opinion that ERM presented the best approach with its soil mixing of Redox-Tech zero valent iron (ZVI) mixed with a biological nutrient and phosphate buffer, to perform abiotic reductive dechlorination and enhance biotic reductive dechlorination (brochure enclosed). All of the vendors bid the project for approximately the same total cost, but ERM treats more source soil for that same cost, delivering the best value. Unlike the other proposals, ERM's does not generate a substantial amount of waste that must be exported to a landfill. Additionally, the ERM proposal includes a permeable reactive barrier of the ZVI-nutrient mixture, to treat shallow groundwater migrating west from the site. A deep barrier is not necessary because the site is underlain by a confining layer. Moreover, ERM will perform a "risk review" to make certain the treatment technology is suitable for the site conditions.

We also appreciate ERM's willingness to substitute treatment technologies to assure cost-effective treatment within the bid amount. As stated in their proposal, "If the risk review concludes that there are unacceptable risks associated with the ZVI mixing at the site, then modification of the proposed remedy will be necessary." Generally, ZVI is a very effective enhanced reductive dechlorination treatment technology as is amply demonstrated at many sites. It accomplishes rapid dechlorination without killing beneficial bacteria and the added nutrients then sustain the beneficial bacteria to further reduce the residual chlorinated compounds.

GONZALEZ SAGGIO & HARLAN LLP
Attorneys at Law

www.gshllp.com

Affiliated with Gonzalez, Saggio and Harlan, L.L.C.

Milwaukee
111 East Wisconsin Avenue
Suite 1000
Milwaukee. WI 53202
Tel (414) 277-8500
Fax (414) 277-8521

Atlanta, GA
Boca Raton, FL
Boston, MA
Chicago, IL
Cleveland, OH

Indianapolis, IN
Los Angeles, CA
Nashville, TN
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West Des Moines, IA

- pilot test ?

However, if the outcome of the risk assessment suggests the ZVI will not perform as intended at this site, then EFLP will seek a change order to allow ERM will implement an alternative remedy. In particular, we have discussed with ERM a change order to substitute an injection of proprietary "Cool-Ox" non-exothermic oxidation compound, provided by Deep Earth Technologies (brochure enclosed).

- 2 appls
- 2 phase I's

EFLP is completing the forms and intends to enroll both the 3941 North Main Street property and the adjacent 2936 North Bay Drive property in the VPLE program and obtain Certificates of Completion for each property. When EFLP's consultant has completed the Phase I ESA Report for the VPLE application, the applications and supporting documents we be sent to your attention. EFLP requests permission to provide only one VPLE deposit from which you can charge for work on both properties.

The EFLP asks that you approve its selection of the ERM proposal and confirm the EFLP's understandings that: a) demolition is eligible for DERP reimbursement of up to $15,000 no matter whether the demolition contractor is hired by ERM or directly by EFLP; and b) a change order will be allowed, if requested, to remediate the site with Deep Earth Technologies' proprietary Cool-Ox instead of ZVI as described above, provided the total estimated remedial cost is no greater than the cost estimate for ERM's ZVI proposal.

Finally, EFLP requests that you approve one round of well sampling or sampling of a limited number of key wells as soon as possible to allow the results to be considered by the ERM risk assessment process.

Yours Very Truly,

William P. Scott

William P. Scott

Enclosures

cc: James C. Small, Ehrlich Family Limited Partnership
Robert Nauta, AECOM

include note on applic.
cc me on appl. cover sheet.

TABLE 1
REMEDIATION BID SUMMARY
EHRLICH FAMILY LIMITED PARTNERSHIP

3941 North Main Street and 2936 North Bay Drive, Racine, Wisconsin

	Stantec	Geosyntec	ERM
Total cost	$336,540	$338,080	$338,430
DERF Eligible	$261,471	$280,730	$264,660
Out-of-pocket	$75,069	$57,350	$73,770
Soil cleanup goal (PCE RCL)	1.23 mg/kg	100 mg/kg	1 mg/kg
Volume of soil to be remediated (CY)	1200	980	1435
Cost	$148,321	$125,510	$186,520
Cost per cubic yard	$123.60	$128.07	$129.98
Demolition costs	$90,069.00	$72,350.00	$88,770.00
Additional comments	Only proposal to include baseline groundwater sampling. Includes tipping fee for soil to be landfilled, but doesn't identify trucking costs or other related costs (e.g., soil profile).	Combination of soil treatment methods complicates things. No regulatory basis for the 100 mg/kg RCL. Because it is never known if more cost will be involved with something like soil mixing, it also adds uncertainty. Client being responsible for the cap could add significant future cost.	Out-of-pocket expenses may actually be over $80,000. Includes a "Risk Review" for $3,415. If this results in the identification of "unacceptable" risks, an alternative approach would be recommended. This would probably meaning going out to bid again unless change order is allowed. Client to remove mercury switches, PCB ballast, etc. prior to demolition - added cost.

REDOX TECH, LLC

"Providing Innovative In Situ Soil and Groundwater Treatment"

ABC^{+} PRODUCT ANNOUNCEMENT

Redox Tech, Inc is pleased to offer an enhanced version of our industry proven Anaerobic Biochem (ABC®) formula, promoting both anaerobic biodegradation and reductive dechlorination of halogenated solvents in groundwater. This product, Anaerobic Biochem Plus (ABC^{+}), is a mixture of our ABC® formula and Zero Valent Iron (ZVI). Formulated and mixed on a site-by-site basis, up to fifty percent (50%) by weight of ZVI can be added. ZVI has been proven and widely accepted as an effective in situ remediation technology of chlorinated solvents such as TCA, PCE, TCE, and daughter products. The degradation process using ZVI is an abiotic reductive dechlorination process occurring on the surface of the granular iron, with the iron acting as an electron donor.

The addition of ZVI to the ABC® mixture provides a number of advantages for enhanced reductive dechlorination (ERD). The ZVI will provide an immediate reduction. The ABC® will provide short-term and long-term nutrients to anaerobic growth, which also assists to create a reducing environment. ABC® contains soluble lactic acid and a phosphate buffer that provides phosphates, which are a micronutrient for bioremediation, and maintains the pH in a range that is best suited for microbial growth. In addition, the corrosion of iron metal yields ferrous iron and hydrogen, both of which are possible reducing agents. The hydrogen gas produced is also an excellent energy source for a wide variety of anaerobic bacteria.

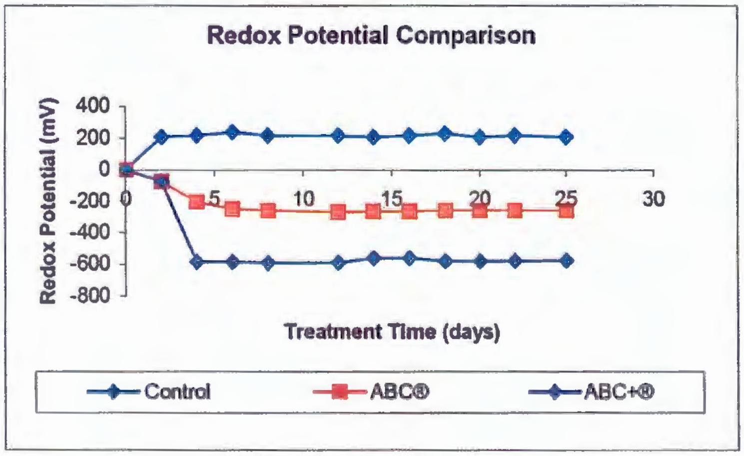
The ABC® and ZVI are mixed with potable water and emplaced in the subsurface simultaneously. The dilution factor (i.e. water content) can be adjusted to achieve optimal dispersion and distribution based on site-specific parameters such as well spacing, permeability of the formation, and contaminant concentrations. The solution can be emplaced by a variety of techniques, including injection through wells or drill rods (for permeable geologic environments such as sands and fractured rock), hydraulic fracturing (for lower permeable environments such as silt and clay), and through soil blending (for all unconsolidated shallow depth applications less than 20 ft bgs). All of these techniques are part of Redox Tech's service offerings.

Benefits of ABC^{+} include:

- The presence of ZVI allows for the rapid and complete dechlorination of target compounds. Degradation rates using ZVI are several orders of magnitude greater than under natural conditions. As a consequence, the process does not result in the formation of daughter products other than ethane, ethane, and methane.
- ABC® will last up to 12 months in the subsurface environment due to slow releasing compounds, allowing for long-term anaerobic biodegradation
- By creating a reducing environment, ABC^{+} has the ability to provide long term immobilization of heavy metals (e.g. Ni, Zn, Hg, As)
- Does not require direct contact to act on target constituents.
-

[1] ABC® is protected by US Patents 6,001,252 and 6,472,198. Trademark pending

- Does not divert groundwater flow. ABC is typically mixed at a 15% by weight solution with water. The viscosity of the solution is similar to sugar water and therefore does not measurably influence groundwater flow paths. Due to the relatively low volume of ZVI used, it does not measurably lower the bulk permeability of the formation.
- Ease of handling. The ABC$^+$ product is comprised of food grade compounds and therefore does not require high-levels of personal protective equipment (PPE) or special training to handle. The ZVI is a stable compound that also requires low-level PPE protection.
- Patent protection: Redox Tech is licensed under Envirometal Technologies, Inc. (an Adventus Company) who is the current holder of patents pertaining to remediation using ZVI. Therefore, Redox Tech is able to market, sell, and emplace our ABC$^+$ product. There is no patent infringement risk to the client in selecting the ABC$^+$ approach.
- Price advantage. The cost of the ABC$^+$ formula is an extremely competitive approach in relation to other ERD products on the market.
- ABC$^+$ produces a significantly lower redox potential of approximately –600 mV



Let Redox Tech help formulate a remedial program for your site today. For more information visit our web page at www.redox-tech.com or contact:

John Haselow
Redox Tech, LLC
200 Quade Drive
Cary, NC 27513
Phone: 919-678-0140
FAX: 919-678-0150
jhaselow@redox-tech.com

a patented technology

controlled oxidation

destroys hydrocarbons & halogenated organics

produces CO_2 & non-toxic reaction products

Cool-Ox^{TM} Technology is a patented remediation process* designed to treat in-situ as well as ex-situ contaminants found in soils and groundwater. The process combines controlled chemical oxidation (targeting hydrocarbons) with abiotic chemical reduction (targeting halogenated organic compounds). Utilizing the application of a single aqueous based formulation, the hydrocarbons are hydroxylated (oxidized) to form alcohols and/or weak organic acids while halogenated compounds are reduced to carbon dioxide and free halogen ions.

produces H_2O_2 in-situ

The process is based upon using hydrogen peroxide as the generator of the oxidizing radicals. However, unlike the Fenton or Fenton like processes that use liquid hydrogen peroxide, *the Cool-Ox^{TM} Process generates hydrogen peroxide from solid peroxygens that are injected into the soil or groundwater in an aqueous suspension. Once in place, the peroxygens react with water to produce hydrogen peroxide.* This reaction is widely understood.

is not a Fenton look-a-like

In conventional Fenton or Fenton like processes, the liquid hydrogen peroxide reacts with injected iron salts introduced to produce the oxidizing radicals. This reaction is largely uncontrollable and produces excessive amounts of heat. Even where the iron is introduced in a separate injection sequence, the reaction can be dangerously robust. Similarly, other processes that have begun using solid peroxygens with introduced iron salts find it difficult to avoid volatilization of contaminants because of the heat produced. The *Cool-Ox^{TM}* Process has eliminated these problems.

H_2O_2 production slow and controlled

longer-lasting

greater radius of influence

greater contact with contaminants

does not use injected catalyst (iron salts)

Because most peroxygens are only sparingly soluble in aqueous solutions, their dissolution rate is quite slow. Therefore, once injected they remain in the contaminated media for an extended period of time before they become soluble. ***This low solubility characteristic also allows peroxygens to be hydraulically distributed by the injection equipment thereby, increasing the radius of influence from the injection point.*** This significantly increases the probability of the oxidizer contacting the contaminants. However, ***the greatest distinguishing feature of the Cool-Ox^{TM} Process is that it does not require the introduction of iron salts to produce the radicals necessary for chemical oxidation.***

chelates produce natural catalysts

Cool-Ox™ does not produce heat

The *Cool-Ox^{TM}* formulations include chelating compounds that activate the intrinsic catalytic metals in the soil matrix being treated. This eliminates the need to artificially introduce iron salts either as a component of the oxidizing reagent or injected sequentially. The use of chelates also imposes a second control factor (the first is the low solubility of the peroxygens) on the reaction rates of the oxidizers. ***These factors allow the oxidation reactions to proceed without producing heat.***

no heat = no volatilization of VOCs

no RCRA metals

leaves no footprints

the only truly "green" process

Therefore, the probability of volatilizing contaminants because of heat generation is eliminated when the *Cool-Ox™* Process is properly employed. This increased control eliminates the risk associated with other oxidizing processes and there are no hazardous metals such as lead, chrome or arsenic in the *Cool-Ox™* formulations. In fact, ***the only artifact remaining after the Cool-Ox™ process has completed contaminant mitigation is calcium. Because the calcium from the process is indistinguishable from naturally occurring calcium compounds such as limestone or calcium carbonates, the Cool-Ox™ process is the only truly "Green Technology" available to date.***

optimum pH of Cool-Ox™ Process is pH=8

will not react with limestone or carbonates in clay

organic compounds exhibiting organic acid characteristics are more soluble in basic solutions thus, are more reactive when treated with the Cool-Ox™ Process

most recalcitrant halogens are readily treatable with Cool-Ox™

An additional and extremely important characteristic of the *Cool-Ox™* Process is the pH at which the oxidation reactions proceed. ***Unlike the Fenton or Fenton-Like reactions that require a low (acidic) pH, the optimum pH of the Cool-Ox™ Process is slightly basic at around pH 8.*** This is critical for treating contaminants found in limestone or soils containing high concentrations of carbonates where a low pH would be buffered toward neutrality. Equally important is the factor that almost all phenolic, chloro-phenolic and chlorinated organic compounds exhibit organic acid characteristics. In general, these compounds become increasingly soluble in aqueous solutions as the pH is increased. Once soluble, they are quite susceptible to oxidation via the *Cool-Ox™* Process. Thus, a broad family of troublesome recalcitrant compounds such as creosotes, PCP, PCBs, PAHs, fuel hydrocarbons, dioxins as well as a host of herbicides and pesticides are treatable using the *Cool-Ox™* Process.

valuable process for pretreating contaminants to accelerate aerobic biodegradation

Microbial plate counts greatly increased after treatment

Cool-Ox™ does not inhibit microbial processes

While the primary function of the Technology is the abiotic hydroxylation of organic contaminants, many see the process as a highly effective and valuable precursor to aerobic bioremediation. ***Once hydroxylated (converted to alcohols), contaminants which, prior to treatment with the Cool-Ox™ process, were recalcitrant to biodegradation become an abundant carbon source for microbial proliferation***. It is not unusual to observe heterotrophic microbial plate counts which prior to treatment may range in the hundreds or thousands, elevating to millions or tens of millions in samples collected subsequent to a *Cool-Ox™* application. It has also been observed in laboratory studies** that the technology does not inhibit microbial processes or have a detrimental effect on plants.

**Cool-Ox™* is a trademark of DeepEarth Technologies, Inc. - all rights reserved.

**Laboratory studies are available upon request.

For information contact toll free 877-COOL-OX1 or tech@deepearthtech.com

CONTAMINATES SUCCESSFULLY TREATED BY

Cool-Ox™

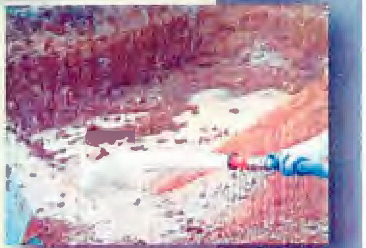
BTEX
Brine
Coal Tars
Vinyl Choloride (DCE)
Chlorobenzenes
Polyaromatic Hydrocarbons
Creasote
Jet Fuel
Chlorinated Herbicides
Chlorinated Pesticides
Pentachlorophenol (PCP)
Chlorinated Solvents
Non-Aqueous Phase Liquid
LNAPL, DNAPL
PCBs
Dioxins
Pesticides
Home Heating Oil
Excavation Odor Control

SITES TREATED

Service Stations
Railroads
Pipelines
Agchem Formulators
Manufactured Gas Plants (MGP)
Wood Treating
Military Bases
Dry Cleaners
Marine Bulk Terminals
Under Building Structures
Sediments
Mixed Plumes
Refineries
Steel Mills
Chemical Plants

Application Techniques

Badger™ Mixer



Pit-Stop™ Overspray

DPT Injections

Hydro-Dart™

Know-How makes the Difference

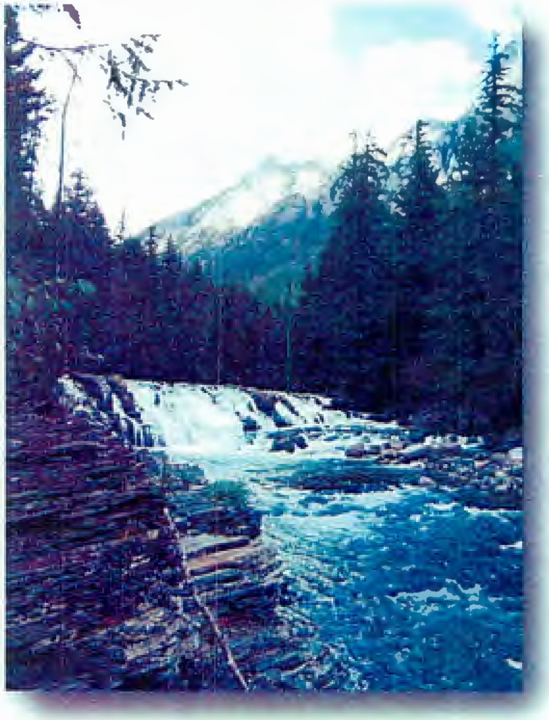
DeepEarth Technologies, Inc.
12635 S. Kroll Dr.
Alsip, Il 60803
708-396-0100
tech@deepearthtech.com
www.deepearthtech.com

DeepEarth Technologies, Inc

"the chem-ox professionals"

Cool-Ox™

Combined Remedies in a Single Technology



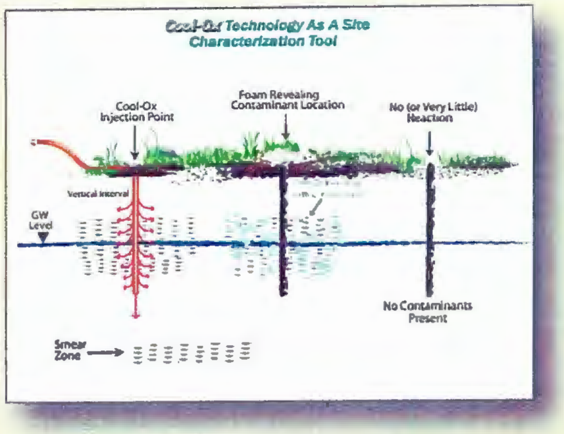
Delivering Site Closures

Controlled In-Situ Chemical Oxidation
What is the Cool-Ox™ process?

Cool-Ox™

Although hydrogen peroxide is widely accepted as the cleanest in-situ chemical oxidation compound, its application using the Fenton mechanism is dangerous and uncontrollable. The extremes in heat and pressure generated by Fenton reaction can volatilize contaminants causing them to spread even further in soil and groundwater. Moreover, concentrated liquid hydrogen peroxide (>10%) has been responsible for numerous accidents.

DeepEarth Technologies, Inc. (DTI) has tamed the Fenton reaction by developing the patented *Cool-Ox*™ technology. By controlling the reaction, contaminant sources can be pin pointed quickly during the site injection work. DTI can then focus on the sources thus assuring maximum effect of the *Cool-Ox*™ reagent. The photo above illustrates this site characterization feature unique to *Cool-Ox*™ technology. The *Cool-Ox*™ process is designed to address a broad variety of remedial challenges found at sites throughout the world.



With Cool-Ox™ you will get:

- **Long Term Oxidation (>90 days)**
- **Sustained Bioremediation**
- **Produced Water (Brine) Mitigation**
- **Application know - how**
- **Free Product Destruction**
- **Aquifer Aeration**
- **Real-Time Situ Characterization**
- **Reductive Dechlorination**
- **Sites Closed**
- **Relief from Environmental Liability**

You won't get:

- **Corrosion**
- **Heat Production**
- **SAR Exacerbation**
  - No Sodium or Potassium
- **Pore Clogging**

*No Further Action

California
- Industrial site: Vinyl Chloride, DCE, TCE
- Wood treating site: Pentachlorophenol (PCP), Mineral Spirits

Florida
- Former retail petroleum site: MTBE
- School bus yard: MTBE
- Former retail petroleum site: MTBE, BTEX
- Operating gas station: BTEX, Naph., MTBE

Illinois
- Former fueling site: BTEX, GRO
- Former service station: BTEX
- Active rail yard: PAH (benzo(a)pyrene)
- Active dry cleaning site: PCE, TCE, DCE, Vinyl Chloride

Indiana
- Industrial site: Vinyl Chloride, DCE, BTEX
- Active rail yard: Silvex, 2, 4, D - 2, 4, DP - 2, 4, 5, T

Ohio
- Industrial site: TPH's, C20 - C34
- Former gas Station: TPH

Louisiana
•Pipeline release: DRO, BTEX

New Jersey
- Industrial site: Mixed Plume – Toluene, TCE

New Mexico
- Kirkland Air Force Base: JP-5 – TPH, PAH

South Carolina
- Pipeline release: Naphthalene

Wisconsin
- Basement of commercial building: Fuel Oil, PAH

ool-Ox™ is a registered trademark of DeepEarth Technologies, Inc.

DeepEarth Technologies, Inc.
12635 S. Kroll Dr.
Alsip, Il 60803
708-396-0100
tech@deepearthtech.com

Contact us for References and Details