RSV
ENGINEERING, INC.
Engineers • Land Surveyors • Environmental Scientists

August 31, 2009

Mr. Jim Delwiche
Wisconsin Department of Natural Resources
141 NW Barstow Street, Room 180
Waukesha, Wisconsin 53188

RE: Estimated Costs
Interim Action –Additional Chemical Oxidant Injections
Klinke Cleaners
Fox Run, Waukesha

Dear Mr. Delwiche:

Pursuant to our meeting on August 24, 2009, RSV Engineering, Inc. (RSV) has prepared this cost estimate for additional chemical oxidant injections to complete the interim action for remediation of tetrachloroethene (PCE) impacted soil at the Klinke Cleaners facility in the Fox Run shopping center, Waukesha (site). The estimate includes costs for a series of three relatively small injections. In advance of further injection activities the scope of work will also include creation of a detailed site map, with more accurate measurements of interior walls, structures and equipment.

Recent Site Activities

Interim site remedial activities, including soil excavation with off-site landfill disposal and injection of chemical oxidant were completed in late May and early June, 2009, generally as outlined in RSV's April 8, 2009 Interim Action Plan. The southern portion of the planned excavation remained unexcavated, due to the presence of a previously unidentified buried sanitary sewer line in that area. Consequently, additional injections were completed in this area as well as in an additional area of soil that was left in place due to high concentrations of PCE, which made injection of this area more cost-effective than excavation and off-site disposal.

Results from VOC analysis of soil samples collected post-excavation and post-injection indicate that residual concentrations of PCE underneath the building and adjacent to the rear door of the building remain at levels above the target remedial goal (TRG) of 1 mg/kg.

During injection activities, significant "daylighting" of reagent (return flow of reagent to the surface, rather than subsurface) occurred. Following receipt of post-injection soil sampling results, it was determined that additional injections should be completed as smaller-scale injections over an

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expanded timeframe to minimize daylighting of reagent and maximize contact with soil containing PCE.

Proposed Additional Injection Activities

Proposed additional injection activities will utilize the Cool-Ox technology (DeepEarth Technologies, Inc.), as previously implemented at the site. Injections subsequent to the initial injection event are generally more successful, as the physical properties of the soil are altered with the introduction of the reagent (soil becomes more "crumbly"), which facilitates more efficient distribution of the reagent within the subsurface. The chemical process by which PCE is degraded was discussed in detail in the Interim Action Work Plan. Due to the confined nature of the drycleaner operational space, a hand-applied method will likely be utilized in this application, as was previously done. Injection points would again be spaced at 5-foot intervals, and the chemical reagent would be injected to a depth of 10 feet below ground surface (bgs). The primary difference between the design parameters for the completed and planned injections would be the volume of reagent injected at each point: the previous injection utilized 36 to 72 gallons of reagent per location, whereas approximately 10 gallons of reagent would be injected at each location during each of the proposed additional injections.

Schedule

An injection event could be completed in one day. To maximize the effectiveness of each injection event, RSV recommends the three events be spaced at 3 month intervals, for a total timeframe of approximately 6 months. This approach would insure that reagent contact time with the contaminant mass is maximized and active reagent presence in the subsurface is sustained for a longer duration.

Costs

The attached Table 1 summarizes the estimated costs for the three injection events, as well as project management, creation of a detailed site map and reporting of results. The estimated cost is approximately $40,500. It should be noted that due to site-specific circumstances encountered during the initial interim action excavation in late May 2009 (mainly subsurface utilities), the total expenditure for the interim action completed to date was approximately $138,000, whereas the budgeted amount was approximately $172,000. Consequently, approximately $34,000 of that budget would be utilized for the completion of the current proposed scope of work, which would mean that an additional $6,500 over the original budget is what would be required to complete the interim action.

RSV is prepared to schedule the work immediately following receipt of WDNR approval of this work scope. Please contact the undersigned with any questions regarding the proposed scope of work.

Sincerely,
RSV ENGINEERING, INC.

Paula A. Richardson, P.G
Staff Hydrogeologist

Robert J. Nauta, P.G.
Vice President

Attachments:

Table 1

cc: Mr. Richard Klinke

TABLE 1
KLINKE CLEANERS
FOX RUN
WAUKESHA, WISCONSIN
INTERIM SOIL REMEDIATION ADDITIONAL INJECTIONS
ESTIMATED COSTS

TASK	UNITS	QTY.	RATE	COST
Task 1: Planning, Reporting & Project Management				
Principal Hydrogeologist	Hours	10	$125	$1,250
Staff Hydrogeologist	Hours	30	$95	$2,850
CADD	Hours	8	$85	$680
Expenses	Estimate	1	$150	$150
			Subtotal:	***$4,930***
Task 2: Injection				
Principal Hydrogeologist	Hours	4	$125	$500
Staff Hydrogeologist	Hours	12	$95	$1,140
Injection Contractor	Estimate	3	$9,881	$29,643
Private Utility Locator	Estimate	1	$300	$300
Expenses	Estimate	1	$250	$250
			Subtotal:	***$31,833***
Task 3: Post-Injection Verification Sampling				
Staff Hydrogeologist	Hours	12	$95	$1,140
Geoprobe	Estimate	1	$1,250	$1,250
Laboratory	Each	15	$75	$1,125
Expenses	Estimate	1	$250	$250
			Subtotal:	***$3,765***
			TOTAL:	**$40,528**