1323-4C-ATTO

Public File Copy

URS

Tuchman Cleaners
Site # 1991 02503
Remediation Planning

RECEIVED
IDEM OCT 16 2006 OER
STATE CLEANUP

October 10, 2006

Dawn Groves, Project Manager
Indiana Department of Environmental Management
100 N. Senate Ave.
Mail Code 6630 IGCN 1101
Indianapolis, IN 46204-2251

Re: Enhanced Pumping Test Results
Tuchman Cleaners
4401 N. Keystone Avenue
Indianapolis, IN

Dear Ms. Groves:

This letter report presents the results of the enhanced pumping test that was conducted at the Tuchman Cleaners (site) located at the above referenced address. The enhanced pumping test was conducted to evaluate the presence/absence of additional recoverable dense non-aqueous phase liquid (DNAPL) in proximity to recovery well RW-3. Prior to conducting the enhanced pumping test, approximately 1,900 pounds of DNAPL were removed from RW-3.

BACKGROUND

In June 2003, relatively high concentrations of tetrachloroethene (PCE [approximately 70 and 230 milligrams per liter (mg/L) in upper and lower sampling intervals respectively]) were detected in groundwater samples collected from recovery well RW-3. An interface probe was used to ascertain the presence of DNAPL; however, DNAPL was not detected in RW-3 (or any other well). Based in the laboratory and groundwater monitoring results, RW-3 was identified as a good location for groundwater pumping and treatment. NDCI and URS elected to install a submersible pump in RW-3 and treat extracted groundwater with the air stripping system that has been operating at the site since 1995 (pumping only from recovery well RW-1 at approximately 10 gallons per minute [gpm]).

In August 2003, URS engaged the services of AST Environmental of Springboro, Ohio to, a) install aboveground piping from RW-3 to the air stripper, and b) replumb the piping at the air stripper to accommodate influents from RW-1 and RW-3. After the appropriate plumbing modifications were complete, URS conducted a 30-minute pumping and treatment test on September 26, 2003. During the pumping and treatment test, URS

URS Corporation
36 East 7th Street, Suite 2300
Cincinnati, OH 45202-4434
Tel: 513.651.3440
Fax: 513.651.3452

collected influent and effluent samples to evaluate the treatment efficiency of the air stripping system at several flow rates.

Laboratory analytical results collected on September 26, 2003 indicated that PCE as DNAPL (likely in the form of water-entrained droplets) was being pumped into the air stripping system from RW-3. This DNAPL was likely pooled on top of the glacial till aquitard near RW-3, and was hydraulically influenced to flow toward RW-3 during the pumping and treatment test. Since the air stripping system can not reliably volatize (strip) water-entrained droplets of DNAPL at any flow rate, the groundwater pumping and treatment scenario was temporarily abandoned. Several site visits were conducted thereafter to confirm and measure the thickness of DNAPL in RW-3, as well as pump as much DNAPL as could be recovered with a peristaltic pump. URS manually recovered approximately 173 pounds of DNAPL by peristaltic pumping between October 22 and November 13, 2003.

In October 2003, NDCI requested that URS design and install an automated DNAPL recovery system. The DNAPL recovery system that was subsequently installed in November 2003 operated with over 95 percent availability through January 2006, removing approximately 2,000 pounds of DNAPL from the subsurface of the site. Over 65 percent of the DNAPL recovered was during the first two months of operation. All DNAPL recovered by this system was transported to Parts Cleaning Technologies, Inc. of Indianapolis, Indiana for solvent recovery and reuse.

By January 2006, the DNAPL recovery rate decreased to less than 0.01 pounds per day (below the field-detectable accumulation rate). Therefore, NDCI elected to stress the aquifer in the vicinity of recovery well RW-3 to evaluate the presence/absence of additional recoverable DNAPL that might, under the induced hydraulic gradient, be encouraged to migrate toward RW-3. The enhanced pumping test was conducted by URS in May 2006 as described below.

ENHANCED PUMPING

Preparation

On May 2, 2006 the DNAPL pump was removed from RW-3 and replaced with a submersible pump capable of approximately 20 gpm. The submersible pump was connected to overhead piping that was installed in August 2003 to connect RW-3 to the

air stripping system (abandoned after the discovery of high-concentrations of PCE in pumped water).

Additional preparation was conducted as follows:

- Deactivated the submersible pump operating at RW-1, and isolated the RW-1 well by closing the RW-1 influent valve at the treatment shed.
- Plugged the gravity drain at the discharge pipe leading from the air stripper sump to the sanitary sewer.
- Set two 500-gallon polyethylene tanks on movable pallets stationed on the south side of building, north of 44th Street. These tanks were connected via bulk-head fittings installed at the base of each tank, resulting in 1,000 gallons of combined storage capacity. A hand-drawn sketch of this arrangement is provided in Attachment 1.
- Plumbed the alternative discharge port from the air stripper sump to a 55-gallon plastic tank (transfer tank) equipped with a 25 gpm sump pump (transfer pump). The discharge from the transfer pump was plumbed via flexible hose to the nearer of the two 500-gallon tanks, terminating in a sprayer assembly (inside the tank) to encourage additional stripping action. A ball valve was installed on the discharge side of the transfer pump to regulate flow to the 500-gallon tank.
- Installed a sump pump in the second of the two 500-gallon tanks. The discharge from this sump pump was plumbed via flexible hose back to the influent side of the air stripping system. This return line was equipped with a ball valve that was kept closed during the pumping test.

Operation

The pump test was conducted on May 3 after ensuring that all fittings were tight. Approximately 1,000 gallons of water was pumped over a one-hour period as follows:

- During the first 15 minutes, the RW-3 pump was operated at 10 gpm to verify the water-tightness of all fittings. No leaks were observed.
- The remainder of the pump test was conducted at an average flow rate of 20 gallons per minute, manually balancing the flow rates of the submersible pump and the repressurization pump to prevent overflow of the 55-gallon transfer tank.

Treatment

Influent and effluent (air-stripped) samples of groundwater were collected during the pump test and submitted to TestAmerica laboratory of Indianapolis, Indiana for rush analysis (same-day turnaround) of 8260B volatile organic compounds (VOCs). These samples were analyzed to 1) evaluate changes in the concentration of total VOCS during the pump test, and 2) to gauge the number of recirculation passes required to reduce the concentration of total VOCs to below the 1 mg/L permitted discharge limit. The analytical results indicated an average influent concentration of approximately 33 mg/L total VOCs. The air stripping efficiency ranged from 94.516 to 99.999 percent removal of total VOCs after a single pass, resulting in effluent concentrations ranging from 0.428 to 1.7 mg/L total VOCs. Sample results are presented on Table 1.

Once the two 500-gallons tanks were full, pumping from RW- 3 and the transfer pump were discontinued. Recovery well RW- 3 was then isolated from the treatment system by closing the influent valve. The accumulated water was then recirculated through the air stripping system for approximately 4 hours at flow rates varying from 17 to 20 gpm, providing approximately 3.5 exchange volumes. The effluent concentrations after two and three exchange volumes (through the air stripping system) were 0.649 mg/L and 0.398 mg/L respectively, operating in continuous recirculation mode (rather than as a batch treatment system).

After the third exchange volume was completed, the air stripper discharge line to the sanitary sewer was reconnected and opened to allow the treated water to discharge under normal air stripper operation. Once the accumulated water was discharged, the air stripping system was returned to normal operation at 10 gallons per minute from only recovery well RW-1.

OBSERVATIONS AND FOLLOW-UP WORK

Laboratory analytical results for influent samples collected during the pump test, though relatively high, were a fraction of the concentration of Total VOCs reported in 2003 when DNAPL was discovered in recovery well RW-3 (See Table 1). Immediately after the pump test was complete, an interface probe was used to detect the presence/absence of DNAPL in RW-3; however the well was heavily silted and the instrument was not operating reliably. A follow-up site visit was scheduled to remove silt from RW-3 and evaluate the presence/absence of a DNAPL layer in RW-3.

On August 3, 2006 a follow-up visit was conducted to jet and pump the silt out of RW-3 and to evaluate the condition of RW- 3 with a submersible video camera. After the well was cleared of silt, an interface probe was used to detect DNAPL, however no DNAPL was detected. The video camera inspection could not be conducted during this site visit because of turbidity resulting from well-cleaning activities.

After allowing the turbid conditions to subside in RW-3, URS returned to the site with a submersible video camera on September 8, 2006. Using a television monitor equipped with a digital video recorder, URS inspected and evaluated the condition of RW-3, particularly the slots of the lower screened interval (of PVC construction) where DNAPL had been present. The video camera inspection indicated that the screen slots are in relatively good condition. The groundwater was also clear, indicating the absence of DNAPL, which has typically appeared as translucent amber liquid where recovered at this facility.

RECOMMENDATIONS

Based on the analytical results, lack of interface detections, and lack of visual evidence of DNAPL, recovery well RW-3 no longer appears to be in connection with a DNAPL layer, if present, at the site. The disappearance of DNAPL is a sign of progress, although dissolved-phase VOCs remain above IDEM action levels. As such, URS and NDCI intend to focus efforts on the removal of elevated concentrations of dissolved VOCs via groundwater extraction at recovery well RW-3.

The results of the pump test indicate that the existing air stripping system is capable of continuously reducing a 10 gpm combined influent concentration of at least 10 mg/L total VOCs to less than 1 mg/L total VOCs (the permit limit) effluent concentration. NDCI and URS plan to control the influent concentration to the air stripper by throttling the influent from RW-1 and RW-3 to 8 gpm and 2 gpm respectively, resulting in an combined-flow influent concentration of approximately 8 – 10 mg/L. Should the RW-1 pump fail to operate at any time, the resultant 5-fold increase in air/water ratio should be sufficient to reduce the influent concentration from RW-3 (alone) to below 1 mg/L (as indicated by the equipment manufacturer and by the pump test results).

Before operating the air stripping system on a full-time basis as indicated above, URS will conduct a one-day performance test to evaluate actual removal efficiencies under

URS

these operating conditions. Once the effluent sample concentrations are verified below the permit limit, the system will be returned to continuous operation. Grab samples will then be collected monthly to evaluate the performance of the air stripping system and to verify that the effluent concentration of VOCs remains below the permit limit.

If you have any questions or comments regarding the information provided in this progress report letter, please contact the undersigned at (513) 651-3440 or Randy Jackson of NDCI at (913) 671-8405.

Sincerely,

URS Corporation

Raymond Vaské

Raymond Vaské
Project Engineer

Dennis P. Connair, P.G.
Principal

cc: Randy Jackson, NDCI

TABLE 1

RECOVERY WELL RW-3 MONITORING AND TEST RESULTS
TETRACHLOROETHENE CONCENTRATIONS

TUCHMAN CLEANERS
4401 N. KEYSTONE AVENUE
INDIANAPOLIS, INDIANA

	Well Installation	Initial Pumping Evaluation			2006 Aquifer Stress Test	
	6/25/2003	9/10/2003	9/26/2003	10/3/2003	5/3/2006	5/3/2006
Tetrachloroethene, mg/L	69 / 230[1]	173	440	112	31	32

[1]Upper / Lower well sample results obtained by peristaltic pumping and disposable bailer respectively.
2003 Laboratory analytical results by Severn Trent Laboratories, Inc. of North Canton, Ohio.
2006 Laboratory analytical results by Pace Analytical Services, Inc. of Indianapolis, Indiana
mg/L = milligrams per liter

ATTACHMENT 1

HAND SKETCH

OF

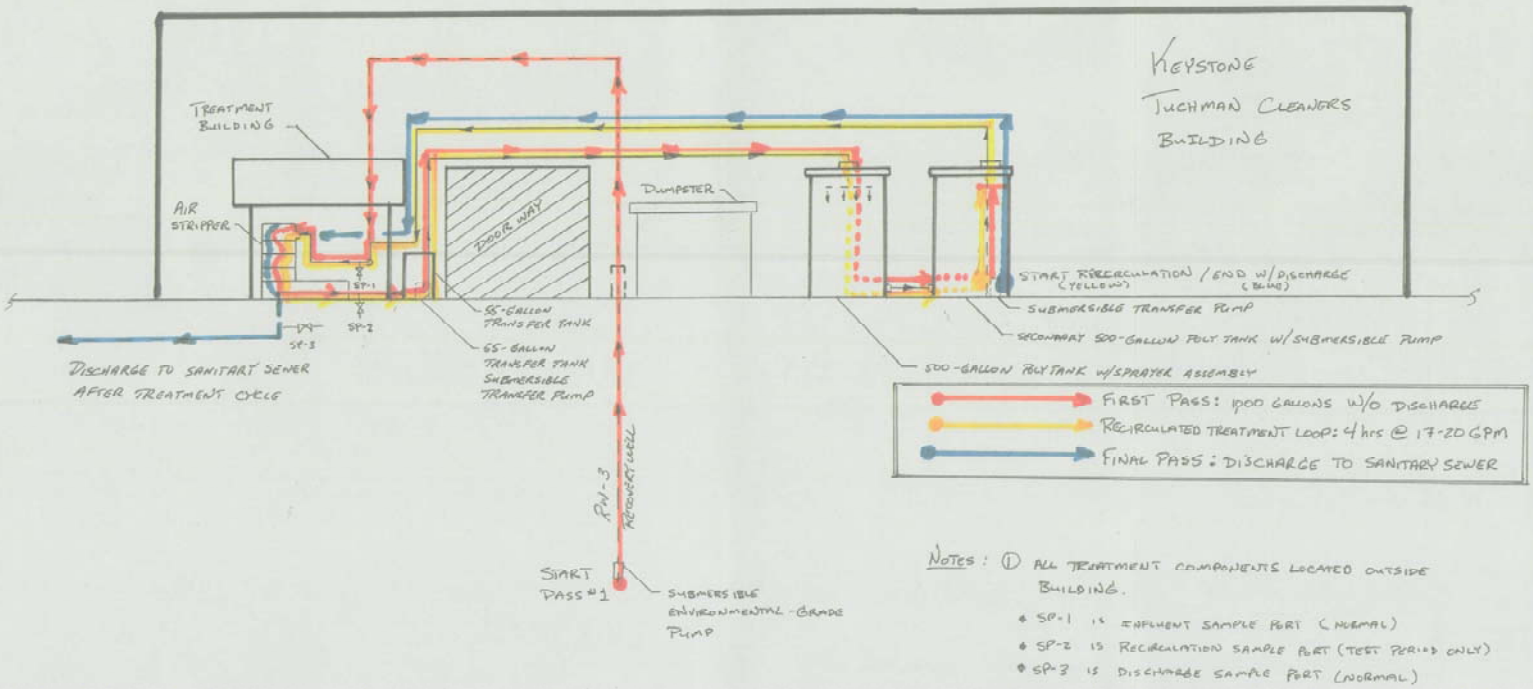
PUMPING AND TREATMENT CYCLES

URS

Job: TUCHMAN CLEANERS - KEYSTONE PUMPING TEST
Description: PUMPING & TREATMENT CYCLES SKETCH

Project No. 14946373
Computed by RJV
Checked by

Page 1 of 1
Sheet 1 of 1
Date 10/10/06



NOTES: ① ALL TREATMENT COMPONENTS LOCATED OUTSIDE BUILDING.

- SP-1 IS INFLUENT SAMPLE PORT (NORMAL)
- SP-2 IS RECIRCULATION SAMPLE PORT (TEST PERIOD ONLY)
- SP-3 IS DISCHARGE SAMPLE PORT (NORMAL)