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NM ENVIRONMENT DEPARTMENT
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PROPOSAL

Vapor Extraction System Pilot Testing
Coors Road Facility
Sparton Technology, Inc.
Albuquerque, New Mexico

Prepared for:

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Objective

The following proposal is a discussion of specific details and operating procedures to conduct and analyze a VES pilot test and to define the limits of elevated soil-gas volatile organic constituent (VOC) concentrations (i.e., the "soil vapor cloud") in the unsaturated subsurface at the Sparton facility. This discussion of technical details and definition of level of effort is a logical extension from the existing data base and should provide sufficient information to determine what, if any, additional work will be needed.

Soil-Gas Monitoring System

A number of monitoring points for both subsurface soil-gas characterization and for vapor extraction pilot test/production purposes have been previously proposed (B&V letter of August 12, 1996). The monitoring system included both existing groundwater monitor wells (with exposed screen) and the existing vapor cluster probe (VP-1) as well as new vapor recovery wells installed in and around the source area. Previous studies had identified highest VOC concentrations in the soil gas in the closed sump area. Concentrations dropped off by orders of magnitude with increasing horizontal distance from the sump/pond (source area).

The proposed monitoring system additions are designed to characterize the soil gas VOC concentration with respect to distance/location relative to the closed sump area. In addition, the monitoring points would be useful in evaluating the effective influence of a vapor recovery well centrally located in the closed sump (source) area. The monitoring system is shown on the attached Figure 1 and includes four existing groundwater monitoring wells (MW-17, MW-21, MW-24, MW-25, and, perhaps, MW-16 depending on seasonal water level (fluctuation), existing six-well vapor probe cluster (VP-1) and five new vapor recovery wells (VR-1 through VR-5).

The new vapor recovery wells are designed to function as both monitoring points and as potential vapor extraction/air injection wells. The new central vapor recovery well (VR-1) would be a four-inch well; the remaining new vapor recovery wells (VR-2 through VR-5) would be two-inch wells. Wells would consist of 60 feet of 0.040-inch machine slotted PVC screen surrounded by a #6 to #9 coarse sand filter. The uppermost 10 feet of each well would be a grouted surface seal to minimize air intrusion or bypassing. Vapor recovery wells would be screened to just above the highest seasonal water level observed in nearby groundwater wells. New wells would be installed using hollow-stem auger

drilling procedures. As part of the characterization work, drilling would be monitored using field screening instruments to provide a relative comparison of soil gas VOC as a function of location, depth, and soil type. Completed wells would also be sampled and analyzed using EPA method 8010/8020 for specific VOC presence/concentration.

The proposed monitoring system is expected to confirm the significant dropoff in soil gas VOC concentration with increasing distance from the closed sump area. In addition, it should also define the area where vapor extraction and treatment would be appropriate.

The need for any additional monitoring/characterization data outside the proposed network would be based on a combination of perimeter soil-gas VOC concentrations above 10 ppmv and projected edge (shape and distribution) of the "vapor cloud" extending out beyond the definition interval of the proposed network. The proposed network has maximum interwell horizontal spacings of ±100 feet in the outer perimeter. Projected vapor cloud edges extending outward less than this interwell spacing should be adequately defined.

Updated Soil-Gas Characterization

Soil-gas data from the additional new wells would be combined with the existing data base to provide a three-dimensional picture of the soil-gas "vapor cloud". This analysis and related data would be presented in the form of an update to the current soil contamination characterization (as presented in the May 6, 1996 Corrective Measure Study (CMS) Report.) Subject to review and approval by NMED, the updated soil-gas characterization would also be used to confirm the application area for vapor extraction and the selection of the pilot test location.

Pilot Test Design

All data obtained to date and the history of the facility indicate that the closed solvent sump is the probable source of VOC observed in the soil gas. Highest soil-gas VOC concentrations occur in the immediate area of the sump with significant VOC concentration decrease observed with increasing horizontal distance from the source area. As a minimum, vapor extraction will be implemented in the sump area. Thus, the sump area is the most logical location for pilot testing.

The pilot test is proposed to define the relationship between VOC concentrations and extraction vacuum and extraction flow rates from a recovery well located directly under the sump area (see Figure 1). Monitoring points (proposed and existing) are located at varying horizontal distances and depths to allow evaluation of effective influence of the centrally located recovery well.

The pilot test is also designed as a prototype demonstration of the planned VES system to show capability for extraction and ability to meet City/County air quality requirements. Further, the pilot test will show probable production rates and estimates of required operation time.

Pilot Test Equipment

For the pilot test, we are proposing AcuVac as the subcontractor to provide necessary equipment. AcuVac is experienced in soil vapor recovery pilot testing in the Albuquerque area and they have demonstrated the ability to successfully conduct meaningful pilot tests and to meet stringent City/County emission requirements. Further, the AcuVac procedure utilizes an environmentally friendly destructive technology to efficiently remove VOC from the extracted soil gas.

The proposed extraction/destruction unit is based around a 300 cubic inch in-line six cylinder internal combustion (I.C.) engine fueled by the extracted soil-gas VOC and supplemental fuel as required. Emissions are controlled by the I.C. process and redundant catalytic converters.

A vacuum blower propelled by the I.C. engine is capable of producing well flow rates of up to 120 cfm and negative pressures of up to 15 inches of mercury. AcuVac-furnished pilot test equipment also includes: a data recording system; magnehelic pressure gauges capable of reading to 0.01 inches of water; soil gas flow measuring devices; real-time field screening/analytical equipment; temperature and barometric measurement; and sampling ports for recovery of influent samples.

Pilot Test Procedure

The pilot test is proposed to be conducted using the central four-inch recovery well (VR-1). The remaining recovery wells (VR-2 through VR-5), UFZ groundwater monitoring wells (MW-17, MW-21, MW-24, and MW-25), and vapor probe cluster

(VP-1) would be used as observation points for the pilot testing (see Figure 1). The pilot testing will be conducted at several different rates of vacuum and flow (up to the maximum capability of the extraction unit) to determine the performance characteristics of the vapor recovery well/adjacent subsurface.

Prior to each individual test, depth to water, temperature and barometric pressure, and magnehelic pressure gauge readings at each monitoring point would be recorded. After the pilot test is started, extraction well vacuum and flow and extraction system operating data (including supplemental fuel flow) will be recorded. Pressure instrumentation at each of the observation wells will be monitored and recorded to determine vacuum communication with the recovery well (demonstration of radius of influence).

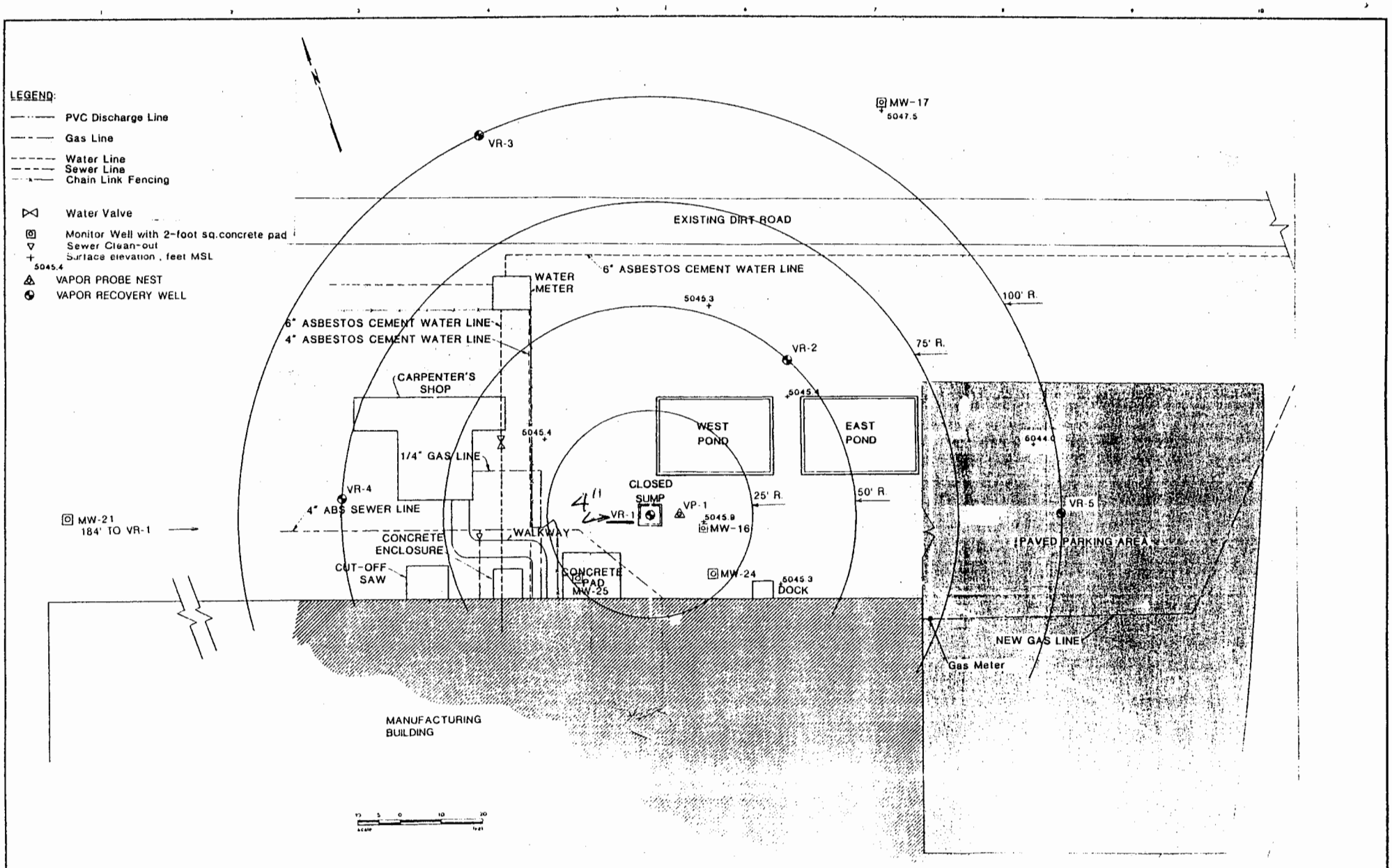
The produced vapor stream (influent) will be analyzed (on a real-time basis) using field screening instruments to determine variation in influent VOC concentration. At selected intervals, influent samples will also be obtained for confirmatory laboratory analyses (EPA Method 8010 and 8020). At least one confirmatory sample will be obtained for each extraction rate test. The purpose of the screening/testing will be to determine VOC concentration variation as a function of both pumping rate/vacuum and elapsed pumping duration.

Based on previous experience, the pilot test should require no more than two days of actual vapor extraction. It is anticipated that two to four extraction rates will be tested. Each extraction rate test will nominally take three to four hours. Upon completion of testing, a detailed pilot test report, including all operating and analytical data and recommendations for operating parameters and effective vacuum radius of influence, will be compiled and provided to NMED for their review and approval.

Pilot Test Schedule

Upon authorization to proceed, it will take from two weeks to over a month to schedule a drilling contractor to install the five vapor recovery wells. Approximately one week will be required to install the wells. Sampling and analytical testing will require several more weeks. Pilot testing can then be arranged in accordance with the subcontractor's schedule. Currently, several weeks are required to mobilize the pilot test equipment; however, once equipment is on site, the actual pilot testing can be conducted in several

days. Interference with the schedule could be caused by the holiday season and possibly weather.



MAP SOURCE: RCRA POST-CLOSURE PERMIT APPLICATION
HARDING LAWSON ASSOCIATES, MARCH 1986

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP

Black & Veatch
Engineers - Architects
Dallas, Texas

DESIGNED
DETAILED
CHECKED
APPROVED
DATE

PROJECT NO.

SPARTON TECHNOLOGY, INC.

COORS ROAD FACILITY
VES - PILOT TEST

FIGURE 1

CONTRACT NO.

SHEET NO.