WORK PLAN FOR THE EVALUATION OF CONTAINMENT SYSTEM PERFORMANCE AND FOR THE ASSESSMENT OF AQUIFER RESTORATION

Prepared For:

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1.0 INTRODUCTION

Sparton Technology, Inc. (Sparton) has proposed the installation, testing and operation of a containment well near the leading edge of an off-site plume of solvents thought to be associated with past operations at its Coors Road Facility in Albuquerque, New Mexico. The operating pumping rate for the off-site containment well will be determined from the results of the tests to be conducted during an investigation program; based on available information, it is estimated that a pumping rate of about 200 gallons per minute (gpm) will be needed to achieve containment.

The purpose of this Work Plan is to describe the procedures that will be used to evaluate the performance of the off-site containment well, and to assess aquifer restoration, including evaluations of alternate remedial measures.

2.0 EVALUATION OF CONTAINMENT SYSTEM PERFORMANCE

The hydrogeologic tests that will be conducted in connection with the operation of the off-site containment well will include a two to three day constant-rate pumping test and a 30-day containment-feasibility test. The constant-rate pumping test will provide information on the transmissivity of the aquifer near the leading edge of the contaminant plume. This transmissivity will be used in conjunction with the prevailing hydraulic gradient in the off-site areas to determine

the pumping rate that should provide hydraulic containment of the plume. Confirmation of the performance of the containment well, that is, the determination of whether the well is indeed containing the plume, will be based on water-level data that will be collected from observation and monitoring wells during the conduct of the containment-feasibility test.

The first step in this evaluation would be to determine the capture zone of the well. Water-level data collected near or at the end of the feasibility test, that is, after the water levels have stabilized, will be contoured to prepare a water-level map which is consistent with the pumping rate of the well and the transmissivity of the aquifer. This water-level map will then be used to calculate groundwater flow paths and determine the capture zone of the well. A particle-tracking routine, such as PATH3D[1], or equivalent, will be used for this purpose. To evaluate whether the well provides containment of the plume, the capture zone determined by this approach will be compared to the extent of the plume, as defined by the 5 µg/l trichloroethylene (TCE) contour. If necessary, adjustments will be made to the pumping rate of the well to achieve containment or to avoid any excessive pumping of uncontaminated water. If the well is not capable of producing the pumping rate required to achieve containment, additional extraction wells may be installed.

During the continuous operation of the containment well, annual evaluations of the capture zone will be made using a similar approach and water-level data collected under the monitoring program; adjustments to the pumping rate will be made, if necessary.

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[1] Zheng, Chunmiao, 1992, *PATH3D 3.2, A Ground-Water Path and Travel-Time Simulator (Third Revision)*: S. S. Papadopulos & Associates, Inc., Bethesda, Maryland.

3.0 ASSESSMENT OF AQUIFER RESTORATION

The reduction in significant releases of solvents from the Sparton property and the containment of the off-site plume by the capture and removal of impacted groundwater could create conditions conducive to aquifer restoration in the off-site area. To assess progress in aquifer restoration and to evaluate alternate remedial measures, water-quality data from monitoring wells, which will be collected under the groundwater monitoring program would be reviewed and evaluated. This review and evaluation will include the preparation of annual TCE isoconcentration maps to document changes in the extent of the plume and in the spatial distribution of TCE concentrations, and of time-concentration plots for the monitored wells to detect temporal trends in concentrations. In addition, monthly samples will be collected from the water produced by the containment well(s) to determine VOC concentrations in the influent to the treatment facility and calculate mass removal rates. The process of aquifer restoration is slow and significant changes in contaminant concentrations would not be expected to occur within short periods of time. It is expected that at least four years of water-quality data would be required to develop a data base that would be adequate for performing a reliable evaluation of the restoration process.

After sufficient data have been collected (currently thought to be four years after the off-site containment and the on-site enhancement wells, and the on-site SVE system have been simultaneously operating), the approach that will be used to assess progress in aquifer restoration and to evaluate alternate remedial measures would be to develop groundwater flow and contaminant transport models for the hydrogeologic system underlying the site and its vicinity. The flow model will be based on geologic and hydrologic data obtained from site investigations and will be calibrated against water-level data from periods prior to and after the beginning of pumping from the proposed

on-site recovery and off-site containment wells. The calibrated flow model will then be coupled with a transport model. The TCE concentrations detected prior to the operation of the on-site recovery and off-site containment wells will be input into the model as initial concentrations and the model will be operated to simulate the effects of the on-site recovery and off-site containment wells and predict spatial and temporal changes in concentration. Transport parameters for this model will be estimated from the observed trends in mass removal rates and changes in concentrations. Further adjustments to these parameters will be made during the calibration process by comparing computed changes in concentrations to those observed during the first four years of operation of the recovery and containment wells, and to predict where concentrations will be at the end of a fifth year.

Development of a model should take six months, involving initial development, review by regulatory authorities and finalization. If the model adequately predicts concentrations at the end of the fifth year, it will then be used to evaluate whether restoration is technically practicable within a reasonable time period. If restoration is practicable, further evaluation will be conducted to determine whether the process can be cost-effectively accelerated. This study should take five months, also consisting of initial development, regulatory review and finalization. In evaluating acceleration possibilities, groundwater extraction alternatives will be evaluated, as well as innovative remedial technologies, that may be available at that time for the remediation of TCE impacted groundwater.