



Department of Energy
Richland Operations Office
P.O. Box 550
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07-AMCP-0063

DEC 19 2006

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Nuclear Waste Program
State of Washington
Department of Ecology
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Richland, Washington 99354

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Addressees:

SOIL VAPOR EXTRACTION AT THE 218-W-4B BURIAL GROUND IN THE 200 WEST AREA

The purpose of this letter is to provide the approved Soil Vapor Extraction (SVE) work plan for your information. This work plan for conducting SVE at Trench T-07 within the 218-W-4B Burial Ground was prepared in accordance with the existing Action Memorandum for the Expedited Response Action (ERA) for the 200 West Area carbon tetrachloride zone plume. This is the same approach that was used for the SVE in 218-W-4C Burial Ground in 2003. The Action Memorandum dated January 21, 1992, signed by the U.S. Environmental Protection Agency and the State of Washington Department of Ecology, selected soil vapor extraction with granular activated carbon recovery as the preferred alternative for the ERA for the 200 West Area carbon tetrachloride plume.

We anticipate that weather permitting, the SVE activity in Trench 7 will be started during December 2006, in order to expedite continued progress toward the retrieval milestones. If you have any questions, please contact me, or your staff may contact Mark French, of my staff, on (509) 373-9863.

Sincerely,

A handwritten signature in black ink, appearing to read "Matthew S. McCormick".

Matthew S. McCormick, Assistant Manager
for the Central Plateau

AMCP:GLS

Enclosure

cc: See Page 2

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cc w/encl:

D. A. Faulk, EPA

J. Ollero, Ecology

D. G. Singleton, Ecology

Administrative Record (M-91)

Environmental Portal

cc w/o encl:

B. M. Barnes, FHI

R. E. Piippo, FHI

V. J. Rohay, FHI

**APPROVAL OF THE FY 2007 VAPOR EXTRACTION SYSTEM WORK PLAN
FOR TRENCH T-07 IN THE 218-W-4B BURIAL GROUND**

The M-91 Project Managers for the Carbon Tetrachloride Vapor Extraction Remediation at Trench T-07 in the 218-W-4B Burial Ground approve the attached FY 2007 Vapor Extraction System Work Plan.

 12/8/06

M. S. French
U.S. Department of Energy
Richland Operations Office

Date

 12/12/06

D. G. Singleton
Washington State Department of Ecology

Date

FY 2007 VAPOR EXTRACTION SYSTEM WORK PLAN FOR TRENCH T-07 IN THE 218-W-4B BURIAL GROUND

Vapor extraction will be performed at Trench T-07 within the 218-W-4B Burial Ground during FY 2007 to remove carbon tetrachloride from the trench free air volume. The primary objectives for this remediation are to minimize release of carbon tetrachloride from the trench to the environment and to protect site workers. Vapor extraction will be conducted in support of waste retrieval activities at Trench T-07. A vapor extraction system (VES), using commercially-manufactured equipment, incorporating a high efficiency particulate air (HEPA) filter, and a granular activated carbon (GAC) adsorber, will be deployed and operated for this activity.

The action will be performed in accordance with:

- *Action Memorandum: Expedited Response Action Proposal for 200 West Area Carbon Tetrachloride Plume* (U.S. Environmental Protection Agency and Washington State Department of Ecology letter to U.S. Department of Energy, Richland Operations Office, CCN 9200423, dated January 21, 1992).

The VES design will be based on:

- *Safety Analysis for the 200 West Area Expedited Response Action for Remediation of Carbon Tetrachloride* (BHI-00089, Rev. 02), Section 2.4.4, "Vapor Extraction System Characterization Unit".

The VES job hazard analysis will evaluate and address scenarios from:

- *Safety Analysis for the 200 West Area Expedited Response Action for Remediation of Carbon Tetrachloride* (BHI-00089, Rev. 02), Section 3.0 "Hazards".

The VES will be manually operated based on guidelines and controls from:

- *Safety Analysis for the 200 West Area Expedited Response Action for Remediation of Carbon Tetrachloride* (BHI-00089, Rev. 02), Section 1.2 "Analysis Summary" and Section 4.0 "Safety Functions and Controls".

Vent risers T-07-4 and T-07-6 in the subject trench have been selected as the primary initial VES withdrawal points based on previous carbon tetrachloride vapor monitoring in support of waste retrieval operations (DOE/RL-2004-70, *218-W-4B Burial Ground Sampling and Analysis Plan*). Additional vent risers in Trench T-07 (or in the eastern portion, referred to as Trench T-07) may be used as withdrawal points, based on the results of additional vent riser sampling. Treated process air will be discharged from the GAC adsorber to atmosphere through an elevated release point. The alternate discharge path is to the trench free air volume through one or more of the existing vent risers. Based on vapor sample and process data collected during operation, the withdrawal and discharge points may be reconfigured to provide additional data for rebound analysis and to optimize carbon tetrachloride removal. Multiple vent risers may be used for withdrawal and discharge.

The waste drums in Trench T-07 are arranged in modules, typically 12 drums wide by 12 drums deep by 4 drums high (576 drums total). Flame retardant 0.64 cm (0.25-in.)-thick plywood sheets were placed to separate the layers of drums and other packages. When the modules were completed, they were covered with 30 mil (0.030-in.) polyvinyl chloride laminated nylon sheeting, followed by a 1.9 cm (0.75-in.)-thick plywood sheet. As a result of this design, the modules are separated from each other by the plastic sheeting, and air flow between the modules is limited or nonexistent. The majority of modules have one riser. Current data indicates that risers T-07-4 and T-07-6 are each in a separate module. The modules are 7.3 m (24 ft) by 7.3 m (24 ft) by 3.7 m (12 ft), for a total module volume of approximately 196 m³ (6,912 ft³). If two modules are connected to the VES through risers T-07-4 and T-07-6, the total module volume would be 392 m³ (13,824 ft³). Assuming 20% of the module volume is free air space, there would be 78 m³ (2,765 ft³) of free air space available for extraction. At a nominal flow rate of 1.4 to 2.8 m³/min (50 to 100 ft³/min), assuming intercommunication within the air volume in each module, extraction for 6 hours, during a normal 8 hour shift, would remove approximately 756 m³ (27,000 ft³) of air, or about 9.7 air changes per shift.

Carbon tetrachloride concentration monitoring will be accomplished through collection of grab-samples and off-line analysis using a field screening instrument that can differentiate carbon tetrachloride from other volatile organic compounds. The samples will be analyzed for chloroform, methylene chloride, and methyl ethyl ketone, in addition to carbon tetrachloride. A minimum level of QC will be performed, including a beginning standard and blank. The data collected during operation and monitoring of the VES system will be organized and maintained on a desktop computer and in the project files. The results will be included in the annual performance evaluation report for carbon tetrachloride vapor extraction operations. The results will also be reported at the M-91 Project Manager Meetings.

Radiological and industrial hygiene surveys will be performed at the HEPA filter and the general VES operations areas, during initial startup and at 1-hour minimum intervals during the first 8-hour shift. As a minimum, radiological and industrial hygiene surveys of the HEPA filter and the general VES operations area will be conducted during the start of operation and periodically during the operation cycle. Radiological surveys will be performed per Health Physics' required radiological surveillance. Industrial Hygiene (IH) surveys will be performed per IH management directions.

Operation of the VES is scheduled to begin before the end of Calendar Year 2006. Design of the VES precludes operation in ambient temperatures below 32 degrees F. As a result, the initial start date and operations schedule may need to be adjusted based on weather conditions.

Following initial operations, vapor extraction will continue on the weekly schedule shown in Table 1 until carbon tetrachloride concentrations measured at the inlet to the primary GAC adsorber are equal to or less than 10 ppmv or as low as reasonably achievable. The VES may be returned to the weekly operations cycle if carbon tetrachloride concentrations start to rise.

VES weekly operation is expected to operate through January 2007, when waste retrieval

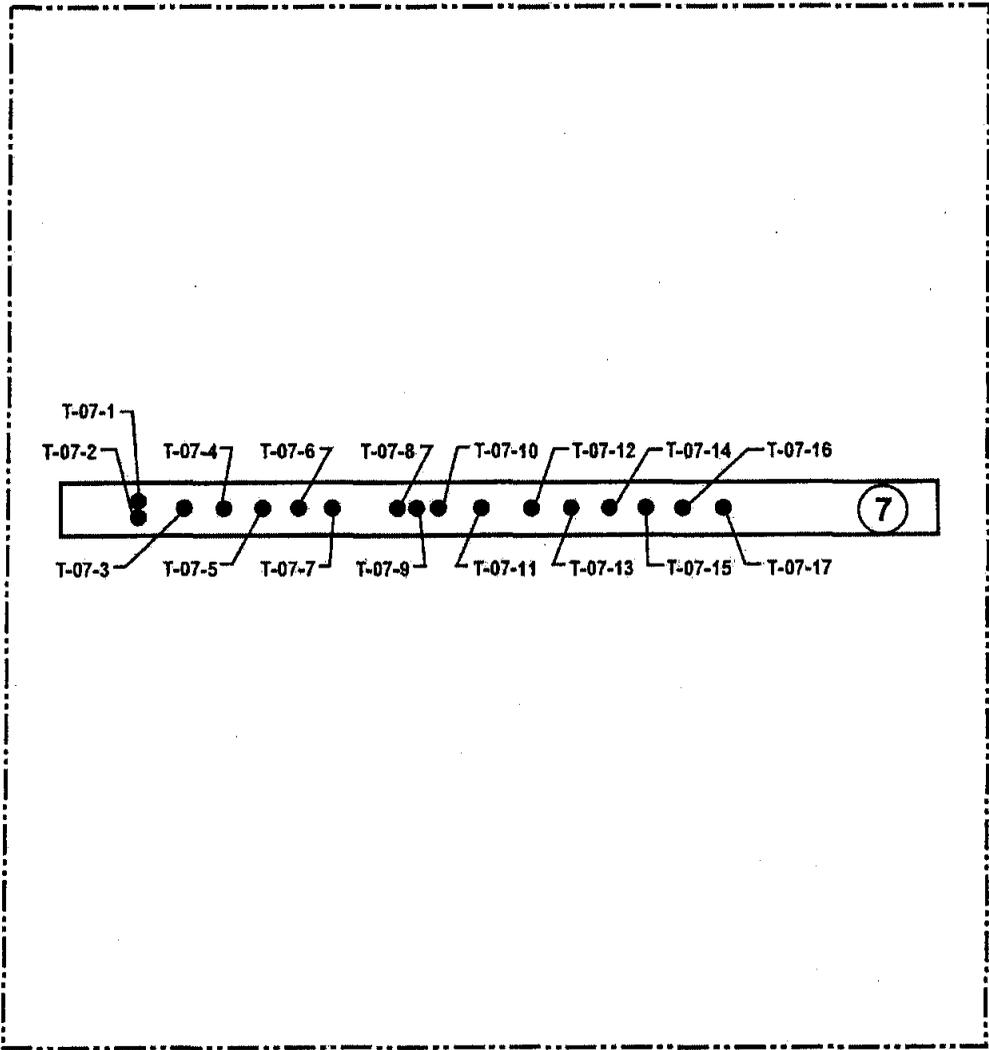
operations at Trench T-07 within the 218-W-4B Burial Ground are anticipated to reach vent risers T-07-4 and T-07-6. If additional vent risers east of vent riser T-07-6 are used as withdrawal points, VES operation may continue beyond January 2007.

Table 1. Weekly Operations Cycle (based on one shift/day).

Monday	VES operation and monitoring for 6-hours
Tuesday	VES operation and monitoring for 6-hours
Wednesday	VES operation and monitoring for 6-hours
Thursday	VES operation and monitoring for 6-hours
Friday	VES operation and monitoring for 6-hours
Saturday	VES offline
Sunday	VES offline

Daily activities are subject to revision based upon VES performance and extra shifts may be added.

Figure 1: Locations of Vent Risers at Trench T-07 in the 218-W-4B Burial Ground



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- ⑦ Trench Number
- Vent Risers in Areas of Retrievably Stored Waste