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START

DATE: September 12, 1989

Bob Stewart

TO: Paul Day
Larry Goldstein

FROM: Bob Stewart
376-6192

SUBJECT: 110-EM-1 RI/FS WORK PLAN - FINAL APPROVAL

Enclosed are revised pages for the subject Work Plan. These pages incorporated the changes that were requested for final approval of the Work Plan; the changes are those mentioned in Paul Day's letter of August 18, 1989, conditionally approving the Work Plan. In general the changes add the specific citations of documents as references, as discussed with you. The pages should be inserted into your copies of the Work Plans distributed on August 15, 1989. You should note that copies of the final Work Plan transmitted to EPA consultants, Ward Staubitz and Emily Pimentel, contained the updated pages.

If you have any questions regarding changes documented in the attached pages, please contact me on 376-6192.

cc w/encl:
Administrative Record (110-EM-1)

cc w/o encl:
W. Staubitz, USGS
E. Pimentel, PRC
R. Wojtasek, WHC
T. Wintczak, WHC
R. McCain, WHC

Leachates generated from the waste-leaching experiments or other suitable means may be passed through composite sediment columns representative of each stratigraphic or lithologic unit. These studies will be performed to evaluate the geochemical behavior of hazardous substances as they migrate through the vadose zone from the near-surface environment to the groundwater.

Groundwater from the "affected environment" beneath these waste sites may also be used in column studies with composite sediments from the upper portion of the unconfined aquifer. If no groundwater contamination exists beneath a site, these aquifer geochemical tests may be redesigned and/or eliminated depending on the extent of contamination. Together, these geochemical analyses provide base-case information for the no-action alternative and the water-flushing alternative.

4.4.1.8 Disposal of Sampling Media. Sampling media include all soils and groundwater brought to the surface while drilling, coring, excavating, pumping, or using other methods in an effort to collect samples or to conduct tests. All media not part of the sample will be controlled according to procedures in the Environmental Investigations and Site Characterization Manual (WHC 1989f)(see Appendix C).

4.4.1.9 Additional Groundwater-Monitoring Wells. In addition to the groundwater-monitoring wells to be drilled at each waste site as part of the RI Phase 1B, five additional monitoring wells have recently been drilled in the 1100 Area to the west and north of the north Richland well field. These wells were drilled as part of the site-wide groundwater monitoring program and are not considered part of the RI/FS effort, although data from these wells will be used as appropriate. In addition, other wells in the vicinity have been identified as available for sampling. These wells are summarized on Table 4-10. Locations of existing and proposed groundwater-monitoring wells are shown in Figure 4-13.

4.4.2 Atmospheric Characterization Program

The atmospheric component of the data collection program is divided into two major tasks. The first task involves characterization and monitoring of air quality, including collection of air samples in the ambient atmosphere upwind from the waste disposal site and samples in the potentially contaminated atmosphere downwind of the site. A comparison of the samples can be used to determine whether or not contaminants are being emitted to the atmosphere from the waste site in quantities that may have a significant environmental impact. The second task involves characterization of the meteorology of the site. This includes the monitoring of winds, atmospheric stability, and other parameters. These data are needed to estimate the atmospheric transport and diffusion of an effluent from a waste disposal site and the resulting ground-level air concentrations.

4.4.2.1 Air-Quality Monitoring. The air quality monitoring program will be designed to monitor air contaminants that may be associated with waste sites in the 1100 Area. Because there is some uncertainty as to the types and quantities of the various wastes at some of the sites in the 1100 Area, a broad spectrum of monitoring will be conducted. Specifically, the monitoring program will examine both volatile and semivolatile organic compounds, pesticides, PCBs, metals, and total suspended particulates.

Chemical analyses will be performed on the 0-, 2-, 5-, and 10-ft depths, and at subsequent 10-ft samples down to and including the saturated zone. These analyses will address the target compound list compounds.

Eight groundwater monitoring wells are proposed at six locations surrounding the Horn Rapids landfill to investigate the hydrologic properties of the unconfined aquifer and to detect groundwater contamination from waste disposal at the landfill (Fig. 4-12). It is anticipated that three of the wells (MW-8, MW-10, and MW-15) will be installed first. Water level readings from these three wells will then be used to determine the groundwater flow direction for the Horn Rapids landfill, and the locations of the other wells will be adjusted as appropriate. The spatial arrangement of the proposed wells is intended to provide two upgradient and six downgradient wells under a range of easterly to northeasterly flow directions. All wells will be drilled 4 to 5 ft into the silt/clay layer. Geologic samples will be taken at 5-ft depth intervals and at changes in lithology during the drilling operations, to support hydrogeologic characterization. These samples will be described and tests for specific hydrologic parameters will be performed per the data quality objectives. One of the upgradient locations and one downgradient location will be well clusters with two wells 25 to 50 ft apart completed in the upper and lower portions of the unconfined aquifer. The purpose of the cluster wells is to determine if contaminant levels are stratified in the aquifer, an observation that is particularly important for dense liquid contaminants such as carbon tetrachloride. All other monitoring wells will be completed in the upper portion of the aquifer.

A ninth groundwater monitoring well (MW-16) will be installed in the vicinity of MW-8 and MW-9. The purpose of this well is to investigate the uppermost confined aquifer and determine the effectiveness of the clay/silt layer as an aquitard. If the piezometric level in the confined aquifer is significantly different from that in the overlying unconfined aquifer, it can be assumed that the clay/silt layer is laterally continuous and effective as an aquitard, at least on a local scale.

After completion of aquifer tests, the monitoring wells will be sampled quarterly for 1 yr. At the end of the 1-yr period, data on contaminant concentrations will be evaluated and a determination will be made on the need for additional sampling. Depth to the water table will be measured on the same quarterly schedule as the groundwater sampling. The need for additional water table mapping will be evaluated after a 1-yr period.

4.4.1.7 Geochemical Analysis of Soil Samples. If the RI phase data identify contamination of concern to the extent that modeling is required, additional data may be obtained during RI to determine contaminant release behavior. These tests will be designed to evaluate contaminant mobility at each of the major waste sites located in the 1100-EM-1 operable unit.

Contaminant release-rate experiments may be performed on composite samples obtained from each of the waste sites. Soil samples containing hazardous substances will be composited for site-specific leaching studies. Wastes will be leached in a column experiment to assess the mobility of hazardous substances found at each site.

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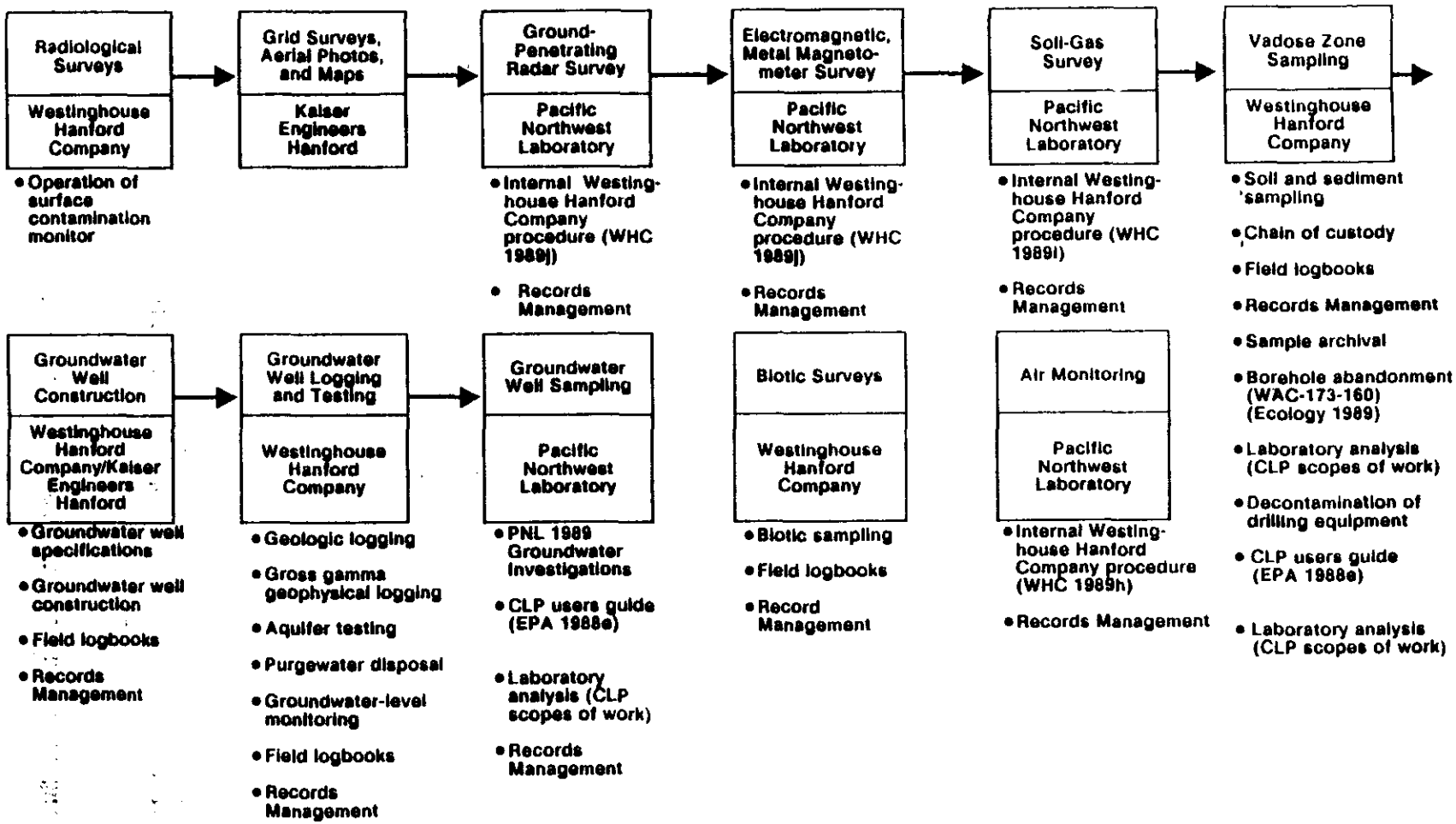
APPENDIX C

ENVIRONMENTAL INVESTIGATION INSTRUCTIONS (EII). (sheet 2 of 2)

Number	Procedure title/topic	Anticipated issue date
EII 6.1	Activity reports of field operations	Completed
EII 6.2	Groundwater monitoring well technical oversight	Completed
EII 6.3	Preparation of groundwater monitoring well construction specifications	Completed
EII 6.4	Groundwater monitoring well maintenance	June 1989
EII 6.5	Plugging and abandoning vadose zone drill holes	Aug 1989
EII 6.6	Groundwater well characterization and evaluation	in preparation
EII 6.7	Well drilling	Oct 1989
EII 6.8	Well completion	in preparation
EII 6.9	Well numbering	Sept 1989
EII 9.1	Geologic logging	Completed
EII 10.1	Aquifer testing	Completed
EII 10.2	Measurement of groundwater levels	Completed
EII 10.3	Disposal of well construction/development waters (purgewater disposal)	In preparation
EII 10.4	Well development activities	in preparation
EII 11.1	Geophysical logging	in preparation
EII 11.2	Ground penetrating radar	in preparation



NOTES:
- See Appendix C for details regarding procedures in process (procedures will be cleared for public release).
- CLP = Contract laboratory program.
- EPA = U.S. Environmental Protection Agency.
- WAC = Washington Administrative Code.

PST89-3024-3

Figure 5-1. Matrix of Specific Procedures.

5.0 QUALITY ASSURANCE PLAN

5.1 INTRODUCTION

The basic objective of the QA plan is to ensure that data, findings, and results are sufficiently accurate and reliable to support decisions associated with site evaluation, risk assessment, and evaluation and selection of remedial alternatives. In addition, activities will be based on approved plans and procedures and adherence to plans and procedures must be enforced and documented. Where necessary, changes to approved procedures and plans will be made in a controlled manner, and adequate documentation will be maintained. Traceability will be established and maintained between results and findings used in making decisions and the original measurements and/or samples.

To achieve the basic QA objective stated above, internal QA documents (Figure 5-1)(ANSI/ASME NQA-1 1986) to RI/FS work. These documents, in conjunction with the procedures listed in Figure 5-1 and Appendix C, provide the basis for a QA program that satisfies DOE-RL Order 5700.1A (1983) and EPA and internal Westinghouse Hanford QA requirements.

5.2 PROJECT QUALITY ASSURANCE ORGANIZATION AND RESPONSIBILITY

Overall project organization and responsibility are discussed in Section 3.0. An organization chart is provided in Figure 3-1. Work associated with the RI/FS will be carried out under the direction of Westinghouse Hanford acting for the DOE. In this capacity, Westinghouse Hanford is responsible for planning, implementing, and maintaining a QA program in accordance with DOE-RL Order 5700.1A (DOE-RL 1983). The purpose of this section is to define the responsibilities of the technical lead, the RI coordinator, the field team leaders, and the quality coordinator with regard to QA.

Figures 3-3 through 3-8 illustrate the organizational structures used to carry out specific RI activities. The technical lead is the designated individual from Westinghouse Hanford responsible for the overall direction of the RI/FS work.

The RI coordinator is the designated individual from the Westinghouse Hanford Environmental Engineering Group who is responsible for coordinating RI activities and ensuring that all laboratory analysis activities are carried out in accordance with approved plans and procedures. The RI coordinator will also supervise data assessment and evaluation carried out by the appropriate RI technical resources.

The field team leaders are designated individuals from Westinghouse Hanford, PNL, or subcontractors who are responsible for a particular sampling or field investigation activity. The field team leader is responsible for ensuring that field investigation and sampling activities are carried out in accordance with approved plans and procedures. The field team leader will also maintain calibration and maintenance records for field equipment and will supervise collection, preparation, handling, storage, and custody of samples, including field quality control (QC) samples.

APPENDIX C

ENVIRONMENTAL INVESTIGATION INSTRUCTIONS (EII). (sheet 1 of 2)

Number	Procedure title/topic	Anticipated issue date
EII 1.2	Preparation and revision of environmental investigation instructions	Completed
EII 1.4	Deviation from environmental investigation instructions	Completed
EII 1.5	Field logbooks	Completed
EII 1.6	Records management	Completed
EII 1.7	Indoctrination, training, and qualification	Completed
EII 2.1	Preparation of health and safety plans	Completed
EII 2.2	Dosimetry (occupational health monitoring)	Completed
EII 3.1	User calibration of measurement and test equipment (health/safety)	Completed
EII 4.1	Nonradioactive hazardous waste disposal	Completed
EII 4.2	Interim control of unknown waste	Sept 1989
EII 5.1	Chain of custody	Completed
EII 5.2	Soil and sediment sampling	Completed
EII 5.3	Biotic sampling	Completed
EII 5.4	Field decontamination of drilling equipment	Completed
EII 5.5	Decontamination of equipment for RCRA/CERCLA sampling	Completed
EII 5.6	Control of geophysical logging	Completed
EII 5.7	Hanford geotechnical library control (sample archiving)	Completed
EII 5.8	Groundwater sampling	in preparation
EII 5.9	Soil-gas sampling	in preparation
EII 5.10	Sample numbering	in preparation
EII 5.11	Sample packaging and shipping	in preparation

APPENDIX C

ENVIRONMENTAL INVESTIGATION INSTRUCTIONS

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