ORNL/ER/Sub/87-99053/50

MARTIN MARIETTA

ENVIRONMENTAL RESTORATION PROGRAM

Data Base Management Plan for the Remedial Investigation of Waste Area Grouping 5 at Oak Ridge National Laboratory, Oak Ridge, Tennessee

MANAGED BY
MARTIN MARIETTA ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

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Data Base Management Plan for the Remedial Investigation of Waste Area Grouping 5 at ORNL, Oak Ridge, Tennessee

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Data Base Management Plan for the Remedial Investigation of Waste Area Grouping 5 at Oak Ridge National Laboratory, Oak Ridge, Tennessee

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DATA BASE MANAGEMENT PLAN

FOR THE

REMEDIAL INVESTIGATION OF WASTE AREA GROUPING 5 AT

OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE

Bechtel Job 19118

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ACRONYMS

NHF	New Hydrofracture Facility
OHF	Old Hydrofracture Facility
OREIS	Oak Ridge Environmental Information System
ORNL	Oak Ridge National Laboratory
PDCC	Project Document Control Center
PP	BNI project procedure
RI/FS	remedial investigation/feasibility study
SWSA	solid waste storage area
TRU	transuranic
USRADS	Ultrasonic Ranging and Data Systems
WAG	waste area grouping

EXECUTIVE SUMMARY

This Data Base Management Plan describes the gathering, verifying, analyzing, reporting, and archiving of data generated during Bechtel's remedial investigation of Waste Area Grouping 5. This investigation will produce data documenting surficial surveys, geophysical surveys, geologic and hydrologic logs, aquifer tests, water level measurements, geophysical logs, and stream and seep flow measurements. Also, laboratory analyses will be performed on soil, surface water, groundwater, and sediment samples.

The 1500 series of Bechtel project procedures, "Data Base Management," and the project Data Base Management Plan will be used to ensure that data are handled properly.

1. INTRODUCTION

1.1 PURPOSE

The remedial investigation (RI) for Waste Area Grouping (WAG) 5 will involve gathering, verifying, analyzing, reporting, and archiving numerous types of field and analytical data. Field investigations will produce data documenting surficial and geophysical surveys, geologic and hydrogeologic logs, aquifer tests, water level measurements, geophysical logs, and stream and seepage flow measurements. Laboratory analyses will be performed on soil, surface water, groundwater, and sediment samples collected during field investigations. All data resulting from these activities will be contained in the Bechtel RI/feasibility study (FS) project data base and will be managed in accordance with the RI/FS Data Base Management Plan and this WAG-specific plan.

1.2 BACKGROUND

During the 40 years of production, operation, and research activities at Oak Ridge National Laboratory (ORNL), various radioactive and hazardous wastes have been generated and disposed of both on site and off site. Waste disposal methods have included shallow land burial in selected areas in Solid Waste Storage Area (SWSA) 5 using trenches and auger holes, above- and below-ground retrievable storage of transuranic (TRU) waste in the TRU Waste Storage Area, and hydraulic fracturing of subsurface geologic formations for liquid and sludge waste disposal at the Old and New Hydrofracture Facilities (OHF and NHF). WAG 5 facilities have been involved in the progressive development of disposal operations at ORNL.

WAG 5 is composed of four main areas: SWSA 5, TRU Waste Storage Area, OHF, and NHF (Fig. 1.1). SWSA 5 and selected areas within the TRU Waste Storage Area were used as waste burial areas from 1959 to 1973. The TRU Waste Storage Area has also been used for the retrievable storage of TRU waste since 1970. In addition to SWSA 5, WAG 5 contains surface facilities, buildings, tanks, sludge basins, and leak sites associated with OHF and NHF.

2. DATA COLLECTION

2.1 FIELD DATA

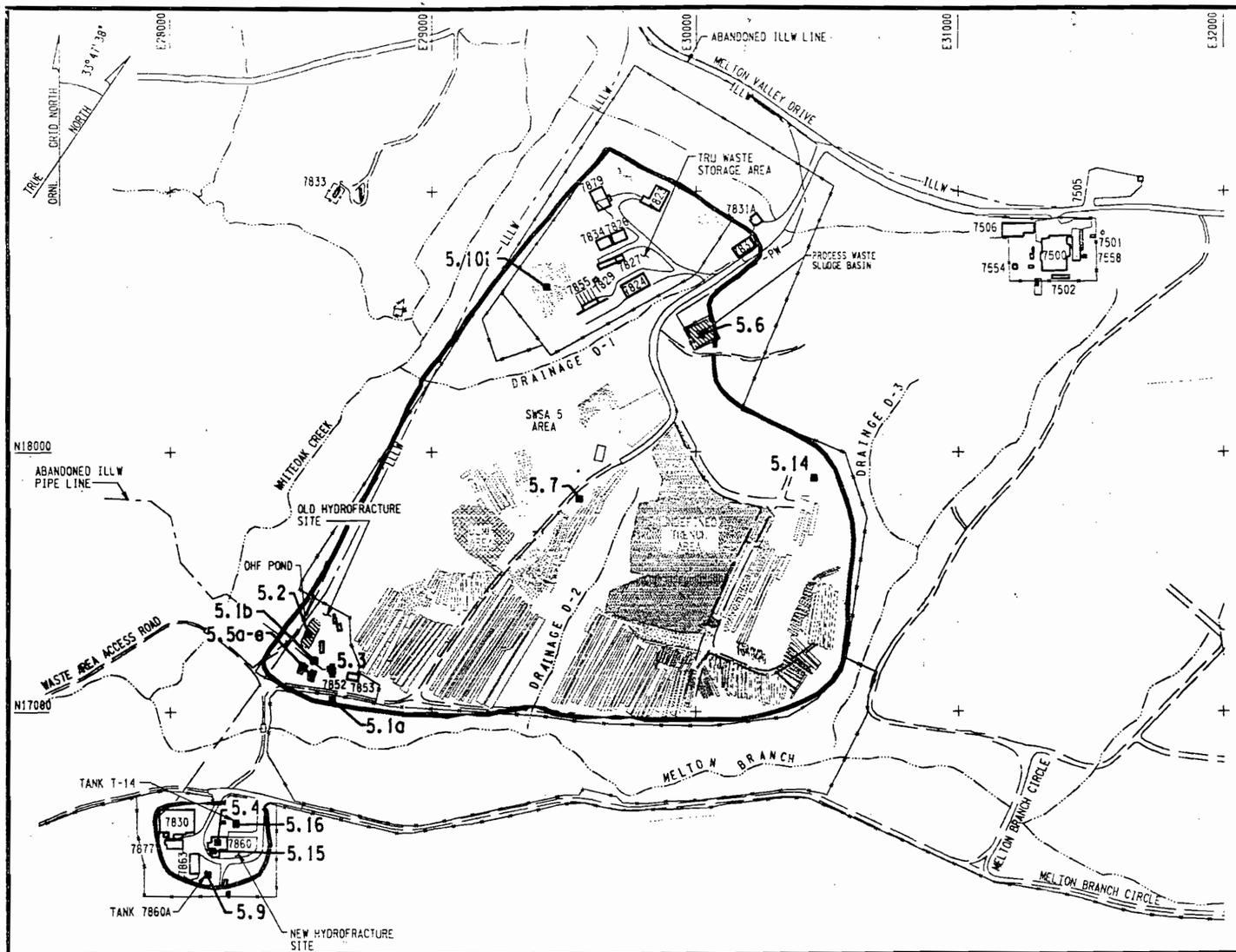
Data from WAG 5 field activities will be collected both electronically and by use of standard data collection forms [as described in Bechtel Project Procedures (PPs) 1501 and 1637]. Data transferred via standard forms will be reviewed by technical specialists, entered twice into appropriate data base tables by different personnel, output into ASCII text files, and compared electronically to determine any differences. Discrepancies will be resolved by review of the original data collection form or reference logbook and, if necessary, consultation with the responsible data gatherer or reviewer. Electronic data [e.g., Ultrasonic Ranging and Data Systems (USRADS) surface radiation walkover results] will be transferred from floppy disks to Bechtel's VAX cluster and loaded into appropriate WAG-specific Oracle tables using Oracle's SQLLOAD utility. Preliminary checks for errors and reasonableness will be performed on raw data by the responsible group before transfer into the data base. Error checking routines and error logging inherent in communications (transfer) and Oracle's SQLLOAD utility software will be performed as data are loaded into Oracle. Finally, data verification will be completed by providing data base output to technical specialists designated as reviewers by the WAG 5 Project Manager. Appropriate validation codes (as defined in PPs 1501 and 1501.1) will be provided by the reviewer and added to each data record.

Collection of soil, groundwater, surface water, and sediment data will be recorded in the field by use of bar codes and bar code readers. Bar code menus have been established for container preparation, sample tracking, container transfer, and sample disposition. The bar code readers will be operated and maintained in accordance with PP 1603.1, "Intermec 9460 Bar Code Reader User's Procedure."

2.2 ANALYTICAL DATA

Laboratory analytical results will be received both in hard-copy data packages and in electronic format on floppy disks. Data files will be uploaded to Bechtel's VAX cluster; transferred to appropriate, WAG-specific Oracle tables using Oracle's SQLLOAD utility and error checking routines; and verified. Verification will be done by comparing the electronic results with the hard-copy data package and with chain-of-custody data resident in the project sample tracking (bar code) data base. When a one-to-one correspondence does not occur, research will be initiated to define and resolve discrepancies. If necessary, the subcontract laboratory will be asked to resubmit the data.

After verification of each data package and the corresponding electronic file has been completed, the data will be transferred (both in hard copy and electronic format) to technical data reviewers. Validation will be performed in accordance with guidelines established by the Environmental Protection Agency and PP 1503.1. Validation flags and comments will



NOTES

1. THE ANGLE OF DECLINATION OF THE ORNL GRID TO TRUE NORTH IS TAKEN FROM THE APPROXIMATE CENTER OF THE WAG.
2. TOPOGRAPHIC AND SITE SPECIFIC INFORMATION PROVIDED BY MARTIN MARIETTA ENERGY SYSTEMS, INC.

LEGEND

- WAG 5 BOUNDARY
- FENCE
- 7824 — BUILDING 7824
- PAVED ROAD
- GRAVEL ROAD
- —LLLW— LOW LEVEL LIQUID WASTE PIPELINE
- —ILLW— INTERMEDIATE LEVEL LIQUID WASTE PIPELINE
- —PW— PROCESS WASTE PIPELINE
- STREAM
- WATER BODY
- 5.16 ■ WAG 5 SWMU

SCALE IN FEET
0 500 1000
0 125 250
SCALE IN METERS

SWMUs IN WAG 5

5.1 a,b	LLW LINES AND LEAK SITES a = OHF, RELEASE OF GROUT b = BUILDING 7852 HYDROFRACTURE INJECTION AREA	5.5 a-e	INACTIVE OHF WASTE STORAGE TANKS (T1, T2, T3, T4, T9) a = T1 b = T2 c = T3 d = T4 e = T9	5.6	PROCESS WASTE SLUDGE BASIN (7835)	5.15	ACTIVE LLLW SLOTTING TANK T-13
5.2	OHF POND (7852A)			5.7	SWSA 5 (7802)	5.16	INACTIVE LLLW TANK T-14
5.3	OHF SITE SURFACE FACILITIES (7852)			5.9	RADIOACTIVELY CONTAMINATED WASTE-OIL STORAGE TANK (7860A)		
5.4	NHF SITE SURFACE FACILITIES (7860)			5.10i	TRU WASTE STORAGE AREA /TRU DIRECT BURIAL TRENCHES		
				5.14	OLD LANDFILL IN NE EDGE OF SWSA 5		NEWLY IDENTIFIED SWMUs

WAG5 05F005.DGN

Fig. 1.1. Map showing locations of SWMUs in WAG 5.

be documented on the hard copy, and appropriate qualification and validation codes will be entered into the electronic file. Complete, validated data packages and data files will be verified by comparing the electronic results file against the hard copy containing validation codes. Validated files will replace the original, unvalidated data in the comprehensive analytical results Oracle table (CON101 in PP 1501.1). Validated data packages will also be retained in the Project Document Control Center (PDCC). Error checking and completeness verification will be performed on all data replacements.

2.3 HISTORICAL DATA

Data transferred to Bechtel's data base from ORNL's existing data base will be verified according to PP 1502 and stored in an Oracle table prior to use by project personnel. Merging of ORNL and Bechtel data will be performed as necessary and according to appropriate data types defined in PP 1501.1. This merging will be done whenever combined data are to be used in producing technical documents or their associated risk assessments, characterization summaries, models, etc. Merged files will be supplied to the Oak Ridge Environmental Information System (OREIS) according to WAG-specific schedules (i.e., during submittal of technical memorandums).

3. DATA BASE CONTENT

Anticipated sources of data associated with WAG 5 field and laboratory activities are listed by data type code in Table 3.1. Full data base content and format listing for each data type can be found in PP 1501.1; master tables defining coded values for various data fields are given in PP 1501.

Engineering applications using the data base, particularly figures generated for reports, will use data resident in project data base tables. Data will be transferred to graphics workstations either in ASCII or Oracle format.

Bechtel's drawing 99-SK-01, "Overall Sampling Task Process Flowchart," illustrates data collection and transfer throughout RI/FS activities. Table 3.1 lists specific data types associated with anticipated field investigations relevant to scheduled WAG 5 activities.

Table 3.1. WAG 5 data base contents

Data type	Data type code	Responsible group
Civil survey		Engineering
Topographic maps	SSV101	
Structures and foundations	SSV103	
Well/piezometer location and elevation	SSV104	
Sampling point location	SSV105	
Surface radiation and dose rates	SSV403	Engineering
USRADS		
Geophysical surveys	SSV201/201A	Geotechnical
Electromagnetic ground conductivity	SSV202/202A	
Magnetometer	SSV203	
Pipe location	SSV301	
Seismic refraction		
Boring and well data	HYG101	Geotechnical
Geologic/drilling log	HYG102/102A	
Well construction log	HYG103	
Well development log	HYG105	
Geophysical well log		
Aquifer tests	HYG201	Geotechnical
Field water level measurements	HYG301/301A	Geotechnical
Groundwater sampling record	HYG701	Geotechnical
Stream flow	HYL101	Modeling
Seepage flow	HYL201	Modeling
Radionuclide and chemical data	CON101	Analytical

4. DATA MANAGEMENT PROCEDURES

Bechtel's RI/FS data base for WAG 5 will be compatible with OREIS. All environmental data will be stored in Oracle tables and will be converted to SAS or Oracle export formats as necessary for transfer to OREIS. Supporting documentation to provide an audit trail for tracking environmental data base content will be stored in PDCC. Documentation will include data collection, transfer, change request, and validation forms. Raw data can be in a number of formats, including bar code reader files, laboratory and field instrumentation log files, spreadsheets, and a variety of encrypted (software-dependent) coded files. Project personnel health and safety information, document control, laboratory sample analysis tracking, engineering, and project management data bases are maintained by the respective functional departments and are explained in individual project procedures and in the project Data Base Management Plan. Data received from ORNL will be tracked by PDCC and included in project data base tables as explained in Sect. 2.3.

Access to data is controlled by procedures found in PP 1501. Verified data can be changed (and changes tracked and approved) by use of "Data Base Change Request" forms. The individual making the request will not make the change. Similarly, data can be output only when approved "Data Base Request for Services" forms are submitted and processed.

Field sample collection and handling are controlled by PPs 1603, 1603.1, and 1637. Intermec bar code readers and printers are used to provide electronic chain of custody and sampling event information. Logbook entries and "Request for Analysis" forms (maintained in accordance with separate project procedures) are used to verify bar code information. Bar code reader contents are uploaded daily to the RI/FS Field Operations Facility computer system and into Oracle tables. Data gatherers are required to verify reader contents frequently, and necessary changes are authorized and controlled by use of "Data Base Change Request" forms submitted to the Data Base Manager.

Bechtel's VAX cluster is the centralized storage location for project data; PDCC houses all supportive documentation. Daily backup on all data is performed by the Automation Technology Department, which is responsible for system management. Weekly, all data are copied to magnetic tape and stored off site. System access is controlled by user name/password and by specific directory and file protection levels determined by project staff. Backup and system access control are explained in "Automation Technology Procedures and Standards." Oracle use requires another level of user name/password and specific privileges for table access, again determined by project staff. Training for each data base management position is defined, administered, and documented according to PP 1120. The Data Base Manager will identify and control the personnel who have received the proper training and demonstrated competence to modify or make additions to data base tables.

REFERENCES AND PERTINENT PROJECT PROCEDURES

Data Base Management Plan for the Remedial Investigation/Feasibility Study at Oak Ridge National Laboratory, Bechtel National, Inc., ORNL/ER/Sub/87-99053/2/R1, Oak Ridge, Tenn.

"Automation Technology Procedures and Standards," Bechtel National, Inc., Oak Ridge, Tenn.

BNI Project Procedure 1120, "Administration of RI/FS Training"

BNI Project Procedure 1501, "Data Collection, Encoding, and Entry"

BNI Project Procedure 1501.1, "Characterization Data Base"

BNI Project Procedure 1502, "Verification of Existing Data"

BNI Project Procedure 1603, "Sample Information Management System"

BNI Project Procedure 1603.1, "Intermec 9460 Bar Code Reader User's Procedure"

BNI Project Procedure 1637, "Field Data Acquisition Documentation"

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