

**U. S. DEPARTMENT OF ENERGY
WORK BREAKDOWN STRUCTURE DICTIONARY
PART II - ELEMENT DEFINITION**

1. PROJECT TITLE/PARTICIPANT Environmental Management/Bechtel Jacobs Company LLC		2. DATE 4/16/03	3. IDENTIFICATION NUMBER DE-AC05-98OR22700
4. WBS ELEMENT CODE 1.12.04.01.01.27		5. WBS ELEMENT TITLE PAD Groundwater Southwest Plume/Sources Action	
6. INDEX LINE NO. N/A	7. REVISION NO. AND AUTHORIZATION rev 1		8. DATE 5/14/03
9. APPROVED CHANGES N/A			
10. SYSTEM DESIGN DESCRIPTION N/A		11. BUDGET AND REPORTING NUMBER N/A	
12. ELEMENT TASK DESCRIPTION			
<p>WBS GRAPHIC</p> <p>See attached.</p> <p>INTRODUCTION</p> <p>In 1988, widespread contamination of groundwater by trichloroethene (TCE) and technetium-99 (Tc-99) around the Paducah Gaseous Diffusion Plant (PGDP) was detected. In 1993, an engineering evaluation cost estimate was approved, and established the water policy box to protect the public from use of impacted groundwater. In 1995 and 1997, interim measures were taken to contain the high concentration areas of the Northwest and Northeast plumes. The interim measures included installation of two groundwater pump and treatment systems, one each at the Northwest and Northeast plumes. Subsequently, remedial investigations were performed to determine the extent of groundwater contamination at PGDP. Results of these investigations detected the presence of dense non-aqueous phase liquid (DNAPL) onsite and up to four dissolved-phase plumes (northeast, northwest, southwest, and Technetium-99 plume) outside the facility fenceline. As a result of the remedial investigations and baseline risk assessment performed for the groundwater operable unit (GWOU), the following groundwater problem statements have been developed.</p> <ul style="list-style-type: none"> - TCE exists as DNAPL in three main areas: C-400 Building, C-720 Building, and C-474-C, Oil Landfarm. This organic compound is found in both the upper continental recharge system (UCRS) and the Regional Gravel Aquifer (RGA) at the C-400 Building and in the UCRS at the C-720 Building and C-474-C, Oil Landfarm. The mass of TCE in these areas must be reduced, removed, or contained before it is possible to return the groundwater back to beneficial use. - TCE and its degradation products exist at lower concentrations throughout the plumes both on and off U. S. Department of Energy (DOE) property. These dissolved concentrations need to be reduced before the groundwater at or around the PGDP can be brought back to beneficial use. - Dissolved-phase TCE and Tc-99 appears to be discharging to surface water in Little Bayou Creek in the off-site area. These releases need to be contained or eliminated to remove direct contact risks to human health and the environment. <p>To address these problems DOE has developed a remedial strategy for PGDP to stop plume growth and migration of contaminants and to reduce the toxicity and volume of contaminants. The strategy includes employing various technologies as an early action, source area actions, fenceline actions, off-site plume actions, and institutional control action. The Southwest Plume/Sources is an early source action also referred to as ROD 1. The Southwest Plume/Sources Action is composed of 7 sub-project tasks. WBS element numbers assigned to the sub-project tasks are:</p>			

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WBS 1.12.04.01.01.27.01 – Technical Management and Integration WBS 1.12.04.01.01.27.02 – Characterization WBS 1.12.04.01.01.27.03 – Decision Documents WBS 1.12.04.01.01.27.04 – Design WBS 1.12.04.01.01.27.05 – Action Implementation WBS 1.12.04.01.01.27.06 – Newly Generated Wastes WBS 1.12.04.01.01.27.07 – DOE Prime																							
LOGIC RELATIONSHIPS <ul style="list-style-type: none"> - The GWOU feasibility study, performed under separate WBS, identified and evaluated technology alternatives to remediate primary and secondary source areas, and dissolved-phase plume areas. Six-phase is a direct heating technology under consideration for treating primary and secondary source areas. - Proposed Plans and RODs are completed as part of the CERCLA process before proceeding with remedial design and remedial action sub-project tasks. - Remedial designs and other decision documents must be complete before proceeding with the construction and operation of the selected remedy for remedial action. 																							
SCOPE DESCRIPTION The objective of this subproject is to perform a CERCLA assessment and cleanup for the GWOU and for ultimate remediation to levels which are protective of human health and the environment. The GWOU consists of the groundwater plumes on and offsite and any sources associated with the plumes. The following Solid Waste Management Units are associated with the Southwest Plume/Sources action.																							
Release Sites and Facilities <table border="0"> <thead> <tr> <th style="text-align: left;"><u>RAIMS</u></th> <th style="text-align: left;"><u>SWMU</u></th> <th style="text-align: left;"><u>Description</u></th> </tr> <tr> <th style="text-align: left;"><u>No.</u></th> <th style="text-align: left;"><u>No.</u></th> <th style="text-align: left;"><u>Description</u></th> </tr> </thead> <tbody> <tr> <td>2047</td> <td>1</td> <td>C-747-C Oil Land Farm</td> </tr> <tr> <td>2678</td> <td>211</td> <td>C-720 TCE Spill Site Northwest</td> </tr> <tr> <td>2477</td> <td>209</td> <td>C-720 Compressor Shop Pit Sump</td> </tr> <tr> <td>2679</td> <td>210</td> <td>Southwest Groundwater Plume</td> </tr> <tr> <td>2677</td> <td>4s</td> <td>C-747 Contaminated Burial Ground</td> </tr> </tbody> </table>			<u>RAIMS</u>	<u>SWMU</u>	<u>Description</u>	<u>No.</u>	<u>No.</u>	<u>Description</u>	2047	1	C-747-C Oil Land Farm	2678	211	C-720 TCE Spill Site Northwest	2477	209	C-720 Compressor Shop Pit Sump	2679	210	Southwest Groundwater Plume	2677	4s	C-747 Contaminated Burial Ground
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Past and Future Accomplishments																							
Past Accomplishments None																							
Future Accomplishments 04.01.01.27.02 Characterization <ul style="list-style-type: none"> - Conduct Scoping meeting with regulators - Prepare D0, D1, and D2 Site Investigation Work Plan - Implement Site Investigation - Prepare Site Investigation /Risk Assessment Report 04.01.01.27.03 –Southwest Plume/Sources Decision Documents																							

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<ul style="list-style-type: none"> - Complete D0, D1, and D2 Proposed Plan - Complete D0, D1, and D2 ROD / LUCIP for ROD 1 - Complete ROD 1 Signature <p>04.01.01.27.04 – Southwest Plume/Sources Design</p> <ul style="list-style-type: none"> - Procure Remedial Design Subcontract(s) - Complete D0, D1, and D2 Remedial Design Work Plan - Obtain regulator approval of D2 Remedial Design Work Plan and Schedule - Complete D0, D1, and D2 Remedial Design Report - EPA/KY approval of the Certified for Construction Design - Complete the D0, D1, and D2 Construction Quality Assurance Plan <p>04.01.01.27.05 – Southwest Plume/Sources Action Implementation</p> <ul style="list-style-type: none"> - Complete D0, D1, and D2 Remedial Action Work Plan - Complete D0, D1, and D2 Construction Quality Assurance Plan - Complete Remedial action. - Complete D0, D1, and D2 Post Construction Report - Regulatory approval of Post Construction Report - Complete D0, D1, and D2 Remedial Action Report <p>04.01.01.27.06 – Southwest Plume/Sources Newly Generated Waste</p> <ul style="list-style-type: none"> - Waste Management. <p>04.01.01.14.07 – C-720 DOE Prime</p> <ul style="list-style-type: none"> - DOE funding source for disposal of waste from remedial actions <p>Scope Description</p> <p>04.01.01.27.01 Technical Management and Integration</p> <p>Technical Management and Integration activities include the technical, subcontract, and project management necessary to ensure that all activities in the WBS elements are completed on schedule, within budget, and without safety or environmental incident. Technical Management and Integration includes the Project Manager and Project Controls personnel who will perform project management, subcontractor oversight, ES&H support, and project scheduling and estimating. Other BJC/M&I support activities will be captured in individual WBS elements.</p> <p>The Fiscal Year Baseline/Life Cycle Baseline activities will be performed on an annual basis to determine the scope of work for future work. The future scope of work will be scheduled and estimated based upon regulatory milestones and DOE commitments.</p> <p>Baseline Change Proposals – Prepare BCP documentation to make necessary corrections to the baseline when scope, schedule, or cost changes are determined necessary.</p> <p>Specific activities include:</p> <ul style="list-style-type: none"> - Ensure completion of all activities within the subproject is in compliance with the principals of Integrated Safety Management - Maintain contact and open communications with the appropriate DOE Project Manager on the subproject activities - Participate in biweekly technical information and monthly Project Status Review meetings to provide the 		

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<p>DOE with project status summaries</p> <ul style="list-style-type: none"> - Manage the subcontracts and work authorizations issued to complete the work under the subproject - Respond and supply information to DOE for Lessons Learned, surveillance and audits, Site-Specific Advisory Board support, and other DOE reporting mechanisms. - Maintain the monthly subproject estimates and estimates at completion. <p>04.01.01.27.02 – Characterization</p> <p>Conduct a preliminary scoping meeting with the regulators to discuss the scope of the Site Investigation Work Plan. Prepare a D0, D1, and D2 Site Investigation Work Plan to fill in data gaps and evaluate risks associated with the southwest plumes/sources including the C-747 Contaminated Burial Ground, C-720, the oil land farm, and the sewer line extending from the C-400 building to KPDES outfall 008.</p> <p>Implement site investigation field work. Field work will include a mixture of soil borings, DPT borings, and monitoring well installations. Sampling and analysis will focus on identification of contaminant sources and characterization of risk from the various areas investigated.</p> <p>A Site Investigation/Risk Assessment Report (D0, D1, and D2) will be prepared to document the results of field sampling and risk analysis. The report will provide the supplemental information needed to proceed with decision documents and remedial design for the Southwest Plume/Sources area.</p> <p>04.01.01.27.03 – Southwest Plume/Sources Decision Documents</p> <p>The Proposed Plan for ROD 1 will be submitted for public review. This includes the C-720 Maintenance Facility, C-747-C Oil Land Farm (SWMU 1), and the storm sewer extending from the C-400 building to KPDES outfall 008. For the C-720 Maintenance Facility and C-747-C Oil Landfarm, Six-phase soil heating and dual phase extraction technologies will be compared and evaluated in the Proposed Plan. C-Sparge and conventional pump and treat methods will be evaluated for the dissolved-phase portion of the Southwest Plume.</p> <p>Complete the D0, D1, and D2 ROD / LUCIP for ROD 1. Complete ROD 1 signature</p> <p>04.01.01.27.04 – Southwest Plume/Sources Design</p> <p>Procure Remedial Design Subcontract(s) to perform all design tasks associated with the selected remedial actions. Complete the D0, D1, and D2 Remedial Design Work Plan. Obtain EPA/KY approval of the Remedial Design Work Plan. Complete the 30%, 60%, 90%, and certified for construction Remedial Design Report. Obtain regulatory approval of the Certified for Construction Design.</p> <p>Complete the D0, D1, and D2 Construction Quality Assurance Plan for the Southwest Plume/Sources Action</p> <p>04.01.01.28.05 – Southwest Plumes/Sources Action Implementation</p> <p>Complete the D0, D1, and D2 Remedial Action Work Plan. Complete the D0, D1, and D2 Construction Quality Assurance Plan.</p> <p>Mobilize for Southwest Plumes/Sources remedial action and finish remedial action. Complete the construction/implementation of the Six-phase Soil Heating for the C-720 and SWMU-1 Oil Landfarm. Six-phase Soil Heating will be used to remediate the UCRS at the locations of C-720 Building</p>		

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<p>(Northeast and Southeast Locations) and the SWMU 1 Oil Landfarm. C-Sparge is assumed to be the method of choice for treatment of the dissolved-phase component of the Southwest Plume. The remedial action is expected to include the installation of four Six-phase heating cells constructed with the associated vapor extraction equipment and the necessary liquid phase separation and vapor phase treatment equipment and three C-Sparge treatment wells near the former PTZ study area. Construction of six phase treatment cells is estimated at six months. Operations and maintenance and systems monitoring of the remedial measures will begin after completion of construction. Six-Phase systems operation is assumed at six months and C-Sparge is assumed to be 10 years.</p> <p>Complete the D0, D1, and D2 Operations and Maintenance Plan for the Southwest Plumes Action. Implement the systems operations and maintenance. Complete D0, D1, and D2 Post Construction Report for the Southwest Plumes Action. Complete D0, D1, and D2 Remedial Action Report.</p> <p>04.01.01.27.06 – Southwest Plume/Sources Newly Generated Waste</p> <p>Waste management activities associated with this subproject will include handling nonhazardous and RCRA-listed waste. With the exception of areas around suspected contaminant sources, the UCRS is expected to be free of RCRA-listed compounds and investigative derived waste from the UCRS will be considered to be nonhazardous. Non-hazardous waste will be disposed of at an off-site sanitary landfill. Soils in suspected source areas and from the RGA are assumed to be RCRA-listed due to the presence of the Southwest TCE plume. RCRA-listed wastes will either be directly disposed of at Envirocare or be thermally treated to reduce TCE concentrations and then disposed of at Envriocare.</p> <p>Safety and Health Work Performance</p> <p>Introduction to the section</p> <p>It is the core value of Bechtel Jacobs Company that the safety and health of every worker and the public at large, and our environment, are the most important assets we are entrusted to protect. To accomplish this, an Integrated Safety Management System (ISMS), based on DOE's ISMS has been implemented that incorporates the five core functions and is based on the seven guiding principles. The objective of ISMS is to systematically integrate safety and environmental protection into the planning and execution of all work activities. The term safety encompasses Nuclear Safety, Industrial Safety, Industrial Hygiene, Occupational Health, Health Physics, and environmental issues. ISMS requirements flow-down to Bechtel Jacobs Company subcontractors. The Five Core Functions are: (1) Define the scope of work, (2) Analyze hazards, (3) Develop and implement hazard controls, (4) Perform work within controls, and (5) Provide feedback and continuous improvement. The Seven Guiding Principles are (1) Line Management Responsibility for Safety, (2) Clear Roles and Responsibilities, (3) Competence commensurate with responsibility, (4) Balanced Priorities, (5) Identification of Safety Standards and Requirements, (6) Hazard Control Tailored to Work Being Performed, and (7) Operations Authorization.</p> <p>For FFA Documents</p> <p>In performing the analysis of alternatives against the CERCLA nine criteria, consideration is given to the principles of ISMS. Specifically, in the analysis of "implementability" and "short-term impact", a trade-off assessment is performed to balance the risk to workers compared to the overall benefit of the project. This assessment follows the five core functions of ISMS to assure that the scope of work and the specific steps to carry out the project have been defined in sufficient detail to analyze the associated hazards, the effectiveness of the controls, and the actual risks to the workers.</p> <p>Before a subproject begins, several activities must be completed that demonstrate that all involved in the project have completed rigorous health and safety reviews and that all potential hazards of doing the work have been</p>		

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<p>identified. The routine activities in RA are conducted in accordance with standard operating procedures, activity hazard analyses, and Integrated Safety Management plans. Non-routine work will require a readiness assessment as necessary to ensure complete health, safety, and environmental reviews prior to work start. This assessment is conducted by people, experienced in similar kinds of work, with the right to examine all aspects of a project about to commence, and require that the project team provide documented evidence that any applicable requirements of the job have been met.</p> <p>REQUIREMENTS/DRIVERS</p> <p>Bechtel Jacobs Company LLC Contract DE-AC05-98OR22700, December 18, 1997 Integrated Safety Management System Description, BJC/OR-87, Revision 2 Paducah Gaseous Diffusion Plant RCRA/HSWA Permit Number KY8-890-008-982 Site Management Plan for PGDP, Fiscal Year 00 Annual Revision, November, 1999 NEPA requirements as ARARs "Integrated Safety Management System Description, BJC-GM-1400, Revision 2, October 2001 and Integrated Safety Management System Supplement, BJC-GM-1401, Revision 0, December 2000"</p> <p>..As applicable, indicate other regulatory-related requirements CERCLA: Y RCRA: Y DNFSB: N DOE Orders: Y AEA: N UMTRCA: N State: Y Other: Y</p> <p>WASTE VOLUMES</p> <p>Please see attached waste performance metrics, as applicable.</p> <p>PROJECT SCHEDULE</p> <p>Please see attached project summary schedule, project detail schedule, and Milestone Status Summary Report. Schedule Assumptions: None.</p> <p>EXECUTION YEAR BASELINE</p> <p>Please see attached Budgeted Cost of Work Scheduled Plan</p> <p>BASELINE BY YEAR</p> <p>Please see attached Baseline by Year Report.</p>		