

0054512

Change Number M-45-00-01A	Federal Facility Agreement and Consent Order Change Control Form Do not use blue ink. Type or print using black ink.	Date December 19, 2000
-------------------------------------	---	----------------------------------

Originator USDOE & Ecology Negotiation Team **Phone** N/A

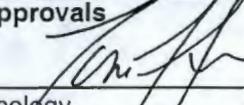
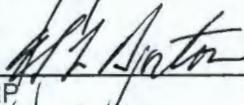
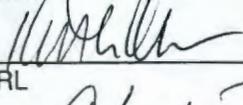
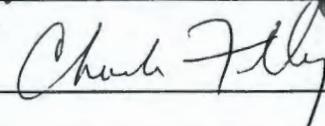
Class of Change
 I – Signatories II – Executive Manager III – Project Manager

Change Title
 Modification of Hanford Federal Facility Agreement and Consent Order (Agreement) provisions governing near term Single-Shell Tank waste retrieval activities necessary for compliance with Washington's Hazardous Waste Management Act (HWMA).

Description/Justification of Change
Introduction
 This Agreement modification establishes near term Agreement milestones, target dates, and associated Agreement language governing single-shell tank (SST) waste retrieval activities prior to September 30, 2006, i.e., Agreement modifications necessary to achieve compliance with federal and state hazardous waste requirements. Ecology and USDOE have concluded negotiations and have submitted this M-45-001A change, the approval of which will establish / modify Agreement requirements. The near term strategy for SST waste retrieval activities has shifted from focusing on maximizing the number of tanks entered for retrieval (regardless of waste volume or content) to a focus on scheduling the retrieval of wastes from those SST's with a high volume of contaminants of concern. These contaminants are defined as mobile, long-lived radionuclides that have a potential of reaching the groundwater and Columbia River. The near term strategy also focuses on the performance of key retrieval technology demonstrations in a variety of waste forms and tank farm locations to establish a technical basis for future work. The near term work scope will also focus on the performance of risk assessments, incorporating vadose zone characterization data on a tank-by-tank basis, and on updating tank farm closure/post closure work plans. Modification scope includes but is not limited to completion of one "Limits of Technology" retrieval demonstration, initiation of a second "Limits of Technology" retrieval demonstration, and retrieval of sufficient SST waste containing an estimated 800 curies of contaminants of concern and occupying a minimum of 2 million gallons of DST space (per DOE, Best-Basis Inventory data, 8/01/2000).

Impact of Change
 Work under this M-45-00-01A modification shall be managed through one unified schedule incorporating Agreement milestones and target dates, DOE (internal agency) milestones, and DOE contractor baseline. Modification of DOE contractor baseline(s) and issuance of associated DOE work directives and/or authorizations that are not consistent with Agreement requirements shall not be finalized prior to approval of an Agreement Change Control Form submitted pursuant to Action Plan Section 12.0. On approval of this M-45-00-01A change, Hanford site baselines, internal planning, management, and budget documents will be modified accordingly.

Affected Documents
 The Hanford Federal Facility Agreement and Consent Order, as amended, DOE's annual Land Disposal Restrictions Report, and Hanford site internal planning, management, and budget documents (e.g., Agreement Action Plan, Appendix D, DOE and DOE contractor Baseline Change Control documents; Multi Year Work Plans; Sitewide Systems Engineering Control documents; Project Management Plans; and the Hanford Site Integrated Priority List (IPL). In addition, this submittal includes a new appendix to the Agreement (appendix H).

Approvals		RECEIVED MAR 12 2001 EDMC			
Ecology 	Date <u>1-9-2001</u>		<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved		
DOE-ORF 	Date <u>1/8/2001</u>		<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved		
DOE-RL 	Date <u>1/8/2001</u>		<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved		
EPA 	Date <u>1-22-01</u>		<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved		

Description/Justification of Change (Cont.)

The following modifications are hereby made to HFFACO major milestone series M-45-00 (Complete closure of all single-shell tank farms). Modifications made to existing HFFACO requirements are shown here as either shaded new text or deleted ~~strikeout~~ text as follows (changes that were made as a result of the public comments, are shown as underlined text):

<p>M-45-00</p> <p>LEAD AGENCY: ECOLOGY</p>	<p>COMPLETE CLOSURE OF ALL SINGLE SHELL TANK FARMS.</p> <p>CLOSURE WILL FOLLOW RETRIEVAL OF AS MUCH TANK WASTE AS TECHNICALLY POSSIBLE, WITH TANK WASTE RESIDUES NOT TO EXCEED 360 CUBIC FEET (CU. FT.) IN EACH OF THE 100 SERIES TANKS, 30 CU. FT. IN EACH OF THE 200 SERIES TANKS, OR THE LIMIT OF WASTE RETRIEVAL TECHNOLOGY CAPABILITY, WHICHEVER IS LESS. IF THE DOE BELIEVES THAT WASTE RETRIEVAL TO THESE LEVELS IS NOT POSSIBLE FOR A TANK, THEN DOE WILL SUBMIT A DETAILED EXPLANATION TO EPA AND ECOLOGY EXPLAINING WHY THESE LEVELS CANNOT BE ACHIEVED, AND SPECIFYING THE QUANTITIES OF WASTE THAT THE DOE PROPOSES TO LEAVE IN THE TANK. THE REQUEST WILL BE APPROVED OR DISAPPROVED BY EPA AND ECOLOGY ON A TANK-BY-TANK BASIS. PROCEDURES FOR MODIFYING THE RETRIEVAL CRITERIA LISTED ABOVE, AND FOR PROCESSING WAIVER REQUESTS ARE OUTLINED IN THE APPENDIX TO THIS CHANGE REQUEST.</p> <p>FOLLOWING COMPLETION OF RETRIEVAL, SIX OPERABLE UNITS (TANK FARMS), AS DESCRIBED IN APPENDIX C (200-BP-7, 200-PO-3, 200-RO-4, 200-TP-5, 200-TP-6, 200-UP-3), WILL BE REMEDIATED IN ACCORDANCE WITH THE APPROVED CLOSURE PLANS. FINAL CLOSURE OF THE OPERABLE UNITS (TANK FARMS) SHALL BE DEFINED AS REGULATORY APPROVAL OF COMPLETION OF CLOSURE ACTIONS AND COMMENCEMENT OF POST-CLOSURE ACTIONS.</p> <p>FOR THE PURPOSES OF THIS AGREEMENT ALL UNITS LOCATED WITHIN THE BOUNDARY OF EACH TANK FARM WILL BE CLOSED IN ACCORDANCE WITH WAC 173-303-610. THIS INCLUDES CONTAMINATED SOIL AND ANCILLARY EQUIPMENT THAT WERE PREVIOUSLY DESIGNATED AS RCRA PAST PRACTICE UNITS. ADOPTING THIS APPROACH WILL ENSURE EFFICIENT USE OF FUNDING AND WILL REDUCE POTENTIAL DUPLICATION OF EFFORT VIA APPLICATION OF DIFFERENT REGULATORY REQUIREMENTS: WAC 173-303-610 FOR CLOSURE OF THE TSD UNITS AND RCRA SECTION 3004(U) FOR REMEDIATION OF RCRA PAST PRACTICE UNITS.</p> <p>ALL PARTIES RECOGNIZE THAT THE RECLASSIFICATION OF PREVIOUSLY IDENTIFIED RCRA PAST PRACTICE UNITS TO ANCILLARY EQUIPMENT ASSOCIATED WITH THE TSD UNIT IS STRICTLY FOR APPLICATION OF A CONSISTENT CLOSURE APPROACH. UPGRADES TO PREVIOUSLY CLASSIFIED RCRA PAST PRACTICE UNITS TO ACHIEVE COMPLIANCE WITH RCRA OR DANGEROUS WASTE INTERIM STATUS TECHNICAL STANDARDS FOR TANK SYSTEMS (I.E., SECONDARY CONTAINMENT, INTEGRITY ASSESSMENTS, ETC.) WILL NOT BE MANDATED AS A RESULT OF THIS ACTION. HOWEVER, ANY EQUIPMENT MODIFIED OR REPLACED WILL MEET INTERIM STATUS STANDARDS. IN EVALUATING CLOSURE OPTIONS FOR SINGLE-SHELL TANKS, CONTAMINATED SOIL, AND ANCILLARY EQUIPMENT, ECOLOGY AND EPA WILL CONSIDER COST, TECHNICAL PRACTICABILITY, AND POTENTIAL EXPOSURE TO RADIATION. CLOSURE OF ALL UNITS WITHIN THE BOUNDARY OF A GIVEN TANK FARM WILL BE ADDRESSED IN A CLOSURE PLAN FOR THE SINGLE-SHELL TANKS.</p> <p>COMPLIANCE WITH THE WORK SCHEDULES SET FORTH IN THIS M-45 SERIES IS DEFINED AS THE PERFORMANCE OF SUFFICIENT WORK TO ASSURE WITH REASONABLE CERTAINTY THAT DOE WILL ACCOMPLISH SERIES M-45 MAJOR AND INTERIM MILESTONE REQUIREMENTS. NOTE: DOE HAS APPEALED THE ISSUE NOTED WITHIN THE PRECEDING SENTENCE TO THE WASHINGTON POLLUTION CONTROL HEARINGS BOARD. THE OUTCOME OF THIS APPEAL MAY AFFECT THIS M-45-00 LANGUAGE.</p> <p>DOE INTERNAL WORK SCHEDULES (E.G., DOE APPROVED SCHEDULE BASELINES) AND ASSOCIATED WORK DIRECTIVES AND AUTHORIZATIONS SHALL BE CONSISTENT WITH THE REQUIREMENTS OF THIS AGREEMENT. MODIFICATION OF DOE CONTRACTOR BASELINE(S) AND ISSUANCE OF ASSOCIATED DOE WORK</p>	<p>9/30/2024</p>
---	---	------------------

Description/Justification of Change (Cont.)

	DIRECTIVES AND/OR AUTHORIZATIONS THAT ARE NOT CONSISTENT WITH AGREEMENT REQUIREMENTS SHALL NOT BE FINALIZED PRIOR TO APPROVAL OF AN AGREEMENT CHANGE REQUEST SUBMITTED PURSUANT TO AGREEMENT ACTION PLAN SECTION 12.0	
M-45-00A	<p>COMPLETE RENEGOTIATION OF "NEAR TERM" (I.E., PRIOR TO 9/30/2006) SST WASTE RETRIEVAL ACTIVITIES.</p> <p>THESE NEGOTIATIONS SHALL TAKE INTO ACCOUNT VARIABLES SUCH AS WORK IN PROGRESS, DOE'S DEVELOPING WASTE TREATMENT COMPLEX PRIVATIZATION INITIATIVE AND ENVIRONMENTAL AND HUMAN HEALTH RISKS ASSOCIATED WITH RELEASES FROM DOE'S SSTs. NEGOTIATIONS SHALL BE DESIGNED TO ESTABLISH A SUFFICIENT NUMBER OF AGREEMENT MILESTONES AND TARGET DATES TO EFFECTIVELY DRIVE EACH PHASE OF WORK INCLUDING BUT NOT LIMITED TO: 1.) WASTE RETRIEVAL TECHNOLOGY DEVELOPMENT (INCLUDING CONFINED SLUICING AND ROBOTIC TECHNOLOGIES), 2.) RETRIEVAL PERFORMANCE EVALUATIONS, 3.) LEAK DETECTION, MONITORING, AND MITIGATION, 4.) SELECTION OF SST RETRIEVAL SEQUENCE, AND 5.) DESIGN, CONSTRUCTION AND OPERATION OF SST WASTE RETRIEVAL SYSTEMS. THESE M-45-00A NEGOTIATIONS SHALL INCLUDE THE ESTABLISHMENT OF INTERIM MILESTONES FOR: A) INITIATION OF CONSTRUCTION, B) INITIATION OF RETRIEVAL, AND C) COMPLETION OF CONFINED SLUICING AT TANK C-104, AND D) INITIATION OF CONSTRUCTION OF A SALTCAKE DISSOLUTION AND RETRIEVAL SYSTEM, E) INITIATION OF RETRIEVAL, AND F) COMPLETION OF SALTCAKE WASTE RETRIEVAL AT TANK S-103. ¹</p>	8/31/2000 (Completed)
M-45-00B	<p>COMPLETE "NEAR TERM" SST WASTE RETRIEVAL ACTIVITIES.</p> <p>UNTIL THE WASTE TREATMENT COMPLEX IS OPERATIONAL, THE AMOUNT OF DST SPACE AVAILABLE TO RECEIVE SST WASTE IS LIMITED. THE NEAR TERM FOCUS FOR SST WASTE RETRIEVAL WILL INCLUDE MAXIMIZING THE TRANSFER OF CONTAMINANTS OF CONCERN (LONG-LIVED, MOBILE RADIONUCLIDES) INTO THE DST SYSTEM. WORK UNDER THIS MILESTONE ALSO INCLUDES COMPLETION OF ONE "LIMITS OF TECHNOLOGY" RETRIEVAL DEMONSTRATION, INITIATION OF A SECOND "LIMITS OF TECHNOLOGY" RETRIEVAL DEMONSTRATION, AND RETRIEVAL OF SUFFICIENT SST WASTE CONTAINING NO LESS THAN 800 CURIES OF CONTAMINANTS OF CONCERN AND OCCUPYING A MINIMUM OF 2 MILLION GALLONS OF DST SPACE (PER DOE BEST-BASIS INVENTORY DATA, 8/01/2000). "LIMITS OF TECHNOLOGY" RETRIEVAL DEMONSTRATIONS WILL SEEK TO IMPROVE UPON PAST PRACTICE SLUICING (PPS) BASELINE TECHNOLOGY INCLUDING BUT NOT LIMITED TO RETRIEVAL EFFICIENCY, LEAK LOSS DURING RETRIEVAL, AND LEAK DETECTION MITIGATION AND MONITORING (LDMM).</p> <p>PROCEDURES FOR MODIFYING THE RETRIEVAL CRITERIA LISTED WITHIN THE ASSOCIATED MILESTONES, AND FOR PROCESSING WAIVER REQUESTS ARE OUTLINED IN A NEW APPENDIX "H" TO THE AGREEMENT. THE APPENDIX IS ATTACHED TO THIS CHANGE REQUEST.</p>	9/30/2006
M-45-02	<p>SUBMIT ANNUAL UPDATES TO SST RETRIEVAL SEQUENCE DOCUMENT.</p> <p>THIS PROVIDES FOR AN ANNUAL UPDATE OF A SST RETRIEVAL SEQUENCE DOCUMENT THAT WILL DEFINE THE TANK RETRIEVAL SEQUENCE, SELECTION CRITERIA AND, TANK SELECTION RATIONALE, REFERENCE RETRIEVAL METHOD(S) FOR EACH TANK, AND THE ESTIMATED RETRIEVAL SCHEDULES. THE RETRIEVAL SEQUENCE DOCUMENT WILL DETAIL RETRIEVAL METHODOLOGIES TO BE EMPLOYED AND ESTIMATED WASTE VOLUMES TO BE GENERATED DURING RETRIEVAL (TO BE TRANSFERRED TO THE DST'S OR OTHER AVAILABLE SAFE STORAGE). THE REPORT WILL ALSO DETAIL TANK SELECTION RATIONALE BASED ON THE PRIMARY OBJECTIVE OF MAXIMIZING RISK REDUCTION THROUGH THE RETRIEVAL OF MOBILE, LONG-LIVED RADIONUCLIDES OR POTENTIAL AIRBORNE CONTAMINANTS AND PRINCIPLE NON RADIOLOGICAL HAZARDOUS CONSTITUENTS IN A MANNER WHICH IS SENSITIVE TO WASTE TREATMENT</p>	9/30/2000 and annually thereafter.

¹ During the conduct of these negotiations, the parties agreed to two basic modifications to these requirements i.e., 1) To base milestones established on completions (e.g. complete construction), and 2) To re-order tanks selected for early retrieval in order to maximize risk reduction and cost efficiency.

Description/Justification of Change (Cont.)

	FACILITY REQUIREMENTS AND INFRASTRUCTURE CONSTRAINTS. <u>THE SEQUENCING WILL ALSO TAKE IN CONSIDERATION DOUBLE-SHELL TANK (DST) SPACE AND DST WASTE COMPATIBILITY WHEN SELECTING THE SST RETRIEVAL SEQUENCE. THE ANNUAL UPDATES WILL BE SUBMITTED TO ECOLOGY FOR APPROVAL AS AGREEMENT PRIMARY DOCUMENTS.</u>	
M-45-02E	SUBMIT ANNUAL UPDATE OF SST RETRIEVAL SEQUENCE DOCUMENT FOR ECOLOGY APPROVAL. (SEE TEXT OF M-45-02 FOR ADDITIONAL DETAILS).	9/30/2000
M-45-00B M-45-00C	<p>COMPLETE RENEGOTIATION OF SECOND PHASE (I.E., 9/30/2006 THROUGH 9/30/2015) SST WASTE RETRIEVAL ACTIVITIES.</p> <p>THESE NEGOTIATIONS SHALL TAKE INTO ACCOUNT VARIABLES SUCH AS WORK IN PROGRESS, E.G., DOE'S DEVELOPING "PRIVATIZATION" TANK WASTE TREATMENT COMPLEX ACQUISITION INITIATIVE AND ENVIRONMENTAL AND HUMAN HEALTH RISKS ASSOCIATED WITH RELEASES FROM DOE'S SSTs. NEGOTIATIONS SHALL BE DESIGNED TO ESTABLISH A SUFFICIENT NUMBER OF AGREEMENT MILESTONES AND TARGET DATES TO EFFECTIVELY DRIVE EACH PHASE OF WORK INCLUDING BUT NOT LIMITED TO: 1.) WASTE RETRIEVAL TECHNOLOGY DEVELOPMENT, 2.) RETRIEVAL PERFORMANCE EVALUATIONS, 3.) LEAK DETECTION, MONITORING, AND MITIGATION, 4.) SELECTION OF SST RETRIEVAL SEQUENCE, 5.) DESIGN, CONSTRUCTION AND OPERATION OF SST WASTE RETRIEVAL SYSTEMS, AND 6.) CLOSURE PLANNING AND CLOSURE PLAN DEVELOPMENT.</p> <p>DOE, AND DOE'S CONTRACTOR(S) WILL RETRIEVE AND TRANSFER SST WASTES INTO THE DST SYSTEM AS SOON AS SPACE IS MADE AVAILABLE, ALLOWING DST SPACE FOR TREATMENT PLANT FEED STAGING AND SAFETY ISSUE RESOLUTION. TRANSFER OF SST WASTE WILL BE MADE ONCE SUFFICIENT DST SYSTEM SPACE IS AVAILABLE TO ALLOW A TRANSFER OF AN OPERATIONALLY PRACTICABLE VOLUME OF WASTE. SST WASTE WILL BE RETRIEVED ON A PRIORITY BASIS WITH THE GOALS OF REDUCING ENVIRONMENTAL RISK AND TREATMENT PROCESS OPTIMIZATION. DOE AND ECOLOGY WILL AGREE ON THE CRITERIA TO DETERMINE ENVIRONMENTAL RISK REDUCTION.</p>	2/28/2004 ^c
M-45-02F	SUBMIT ANNUAL UPDATE OF SST RETRIEVAL SEQUENCE DOCUMENT FOR ECOLOGY APPROVAL. (SEE TEXT OF M-45-02 FOR ADDITIONAL DETAILS).	9/30/2001
M-45-02G	SUBMIT ANNUAL UPDATE OF SST RETRIEVAL SEQUENCE DOCUMENT FOR ECOLOGY APPROVAL. (SEE TEXT OF M-45-02 FOR ADDITIONAL DETAILS).	9/30/2002
M-45-02H	SUBMIT ANNUAL UPDATE OF SST RETRIEVAL SEQUENCE DOCUMENT FOR ECOLOGY APPROVAL. (SEE TEXT OF M-45-02 FOR ADDITIONAL DETAILS).	9/30/2003
M-45-02I	SUBMIT ANNUAL UPDATE OF SST RETRIEVAL SEQUENCE DOCUMENT FOR ECOLOGY APPROVAL. (SEE TEXT OF M-45-02 FOR ADDITIONAL DETAILS).	9/30/2004 and annually thereafter
M-45-03-T01	<p>COMPLETE SST WASTE RETRIEVAL DEMONSTRATION.</p> <p>INITIATE AND COMPLETE A FULL SCALE DEMONSTRATION OF SST RETRIEVAL TECHNOLOGY. THIS DEMONSTRATION WILL BE CONSIDERED COMPLETE WHEN NO LESS THAN 99% OF THE WASTE INVENTORY IS REMOVED FROM THE TANK.</p>	9/30/2003
M-45-03C	COMPLETE FULL SCALE SALTCAKE WASTE RETRIEVAL TECHNOLOGY DEMONSTRATION AT SINGLE-SHELL TANK S-112. WASTE SHALL BE RETRIEVED TO THE DST SYSTEM TO THE LIMITS OF THE TECHNOLOGY (OR TECHNOLOGIES) SELECTED. SELECTED SALTCAKE RETRIEVAL TECHNOLOGY (OR TECHNOLOGIES) MUST SEEK TO IMPROVE UPON THE PAST-PRACTICE SLUICING BASELINE IN THE AREAS OF EXPECTED RETRIEVAL EFFICIENCY, LEAK LOSS POTENTIAL, AND SUITABILITY FOR USE IN POTENTIALLY LEAKING TANKS. THIS	9/30/2005

²

These negotiations will also consider the need for additional compliant storage space. Should DOE fail to initiate construction of the Phase I Hanford Tank Waste Treatment Complex by December 31, 2001, as defined in Agreement interim milestone M-62-06, the due date for this M-45-00C milestone shall be automatically adjusted to 4/30/2002.

Description/Justification of Change (Cont.)

	<p>DEMONSTRATION SHALL ALSO INCLUDE THE INSTALLATION AND IMPLEMENTATION OF FULL SCALE LEAK DETECTION, MONITORING, AND MITIGATION (LDMM) TECHNOLOGIES. THE PARTIES RECOGNIZE AND AGREE THAT THIS ACTION IS FOR DEMONSTRATION AND INITIAL WASTE RETRIEVAL PURPOSES. COMPLETION OF THIS DEMONSTRATION SHALL BE BY WRITTEN APPROVAL OF DOE AND ECOLOGY.</p> <p>GOALS OF THIS DEMONSTRATION SHALL INCLUDE THE RETRIEVAL TO SAFE STORAGE OF APPROXIMATELY 550 CURIES OF MOBILE, LONG-LIVED RADIOISOTOPES AND 99% OF TANK CONTENTS BY VOLUME (PER DOE BEST-BASIS INVENTORY DATA, 8/01/2000).</p>	
M-45-03-T03	<p>SUBMIT S-112 SALTCAKE WASTE RETRIEVAL TECHNOLOGY DEMONSTRATION FUNCTIONS AND REQUIREMENTS DOCUMENT.</p> <p>THIS DOCUMENT WILL ESTABLISH DEMONSTRATION SYSTEM SPECIFICATIONS (INCLUDING LDMM SYSTEM SPECIFICATIONS) AND WILL ALSO INCLUDE A SCOPING LEVEL RETRIEVAL PERFORMANCE EVALUATION (RPE). THE FUNCTIONS AND REQUIREMENTS DOCUMENT AND ITS ASSOCIATED RPE SHALL PROVIDE ENVIRONMENTAL AND HUMAN HEALTH RISK EVALUATION DATA/INFORMATION ASSOCIATED WITH ESTIMATED WASTE VOLUMES TO BE RETRIEVED, THE MAXIMUM VOLUME WHICH COULD LEAK DURING RETRIEVAL, AND RISK FROM RESIDUAL WASTE. THIS DOCUMENT WILL DETAIL KNOWN AND ESTIMATED RADIONUCLIDE CONTAMINATION AND CONTAMINANT MIGRATION WITHIN THE VADOSE ZONE AS BASES OF CALCULATION. LDMM AND RPE DOCUMENTATION PROVIDED WILL BE ADEQUATE TO ALLOW ECOLOGY TO ASSESS THE ADEQUACY OF THE DEMONSTRATION SYSTEMS. THIS DOCUMENT WILL INCORPORATE LESSONS LEARNED, INCLUDING LDMM, RETRIEVAL, INSTRUMENTATION, AND OPERATIONAL EXPERIENCE FROM PREVIOUS DOE AND INDUSTRY RELATED RETRIEVAL PROJECTS. DOE WILL SUBMIT ITS S-112 LDMM STRATEGY AS PART OF THE FUNCTIONS AND REQUIREMENTS DOCUMENT, PRIOR TO INITIATION OF DESIGN. THE S-112 FUNCTIONS AND REQUIREMENTS DOCUMENT WILL BE SUBMITTED FOR ECOLOGY APPROVAL AS AN AGREEMENT PRIMARY DOCUMENT.</p> <p>THIS FUNCTIONS AND REQUIREMENTS DOCUMENT WILL BE <u>TIMELY</u> SUBMITTED <u>IN A TIMELY FASHION</u> SO THAT PROJECT CRITICAL PATH IS NOT AFFECTED, AND SO AS TO ALLOW ADEQUATE TIME FOR DOE AND ECOLOGY REVIEW, REVISION AND APPROVAL.</p>	12/30/2001
M-45-03D	<p>COMPLETE S-112 SALTCAKE WASTE RETRIEVAL TECHNOLOGY DEMONSTRATION DESIGN (TO INCLUDE ALL PHYSICAL SYSTEMS INCLUDING DESIGN AND OPERATING STRATEGIES NECESSARY FOR LEAK DETECTION MONITORING AND MITIGATION (LDMM)).</p> <p>DESIGN WILL BE CONSIDERED COMPLETE WHEN 90% OF THE DESIGN HAS BEEN APPROVED FOR FABRICATION AND/OR CONSTRUCTION.</p>	5/31/2003
M-45-03E	<p>COMPLETE S-112 SALTCAKE WASTE RETRIEVAL TECHNOLOGY DEMONSTRATION CONSTRUCTION (TO INCLUDE ALL PHYSICAL SYSTEMS INCLUDING THOSE NECESSARY FOR LEAK DETECTION MONITORING AND MITIGATION).</p> <p>CONSTRUCTION WILL BE CONSIDERED COMPLETE WHEN ALL PROCESS EQUIPMENT IS INSTALLED AND ACCEPTANCE TESTS ARE COMPLETED.</p>	9/30/2004
M-45-03F	<p>COMPLETE FULL SCALE SLUDGE/HARD HEEL, CONFINED SLUICING AND ROBOTIC TECHNOLOGIES, WASTE RETRIEVAL DEMONSTRATION AT TANK C-104.</p> <p>WASTE SHALL BE RETRIEVED TO THE DST SYSTEM TO THE LIMITS OF THE TECHNOLOGY (OR TECHNOLOGIES) SELECTED. SELECTED SLUDGE/HARD HEEL TECHNOLOGY (OR TECHNOLOGIES) MUST SEEK TO IMPROVE UPON THE PAST-PRACTICE SLUICING BASELINE IN THE AREAS OF EXPECTED RETRIEVAL EFFICIENCY, LEAK LOSS POTENTIAL, AND SUITABILITY FOR USE IN POTENTIALLY LEAKING TANKS. CONFINED SLUICING IS DEFINED AS THE LOCALIZED ADDITION AND RETRIEVAL OF LIQUIDS AND WASTE. THIS DEMONSTRATION SHALL ALSO INCLUDE THE INSTALLATION AND IMPLEMENTATION OF FULL SCALE LEAK</p>	<p>TBE (This milestone date shall be established during the parties' M-45-00C negotiations.)</p>

Description/Justification of Change (Cont.)

	<p>DETECTION, MONITORING, AND MITIGATION (LDMM) TECHNOLOGIES. THE PARTIES RECOGNIZE AND AGREE THAT THIS ACTION IS FOR DEMONSTRATION AND INITIAL WASTE RETRIEVAL PURPOSES. COMPLETION OF THIS DEMONSTRATION SHALL BE BY APPROVAL OF DOE AND ECOLOGY.</p> <p>GOALS OF THIS DEMONSTRATION SHALL INCLUDE THE RETRIEVAL TO SAFE STORAGE OF APPROXIMATELY 89 KG OF PLUTONIUM WHICH REPRESENTS APPROXIMATELY 17% OF THE TOTAL PLUTONIUM INVENTORY WITHIN THE SST SYSTEM), AND 99% OF TANK CONTENTS BY VOLUME (PER DOE'S BEST-BASIS INVENTORY DATA OF 8/01/2000).</p>	
M-45-03-T04	<p>SUBMIT C-104 SLUDGE/HARD HEEL, CONFINED SLUICING AND ROBOTIC TECHNOLOGIES, WASTE RETRIEVAL DEMONSTRATION FUNCTIONS AND REQUIREMENTS DOCUMENT.</p> <p>THIS DOCUMENT WILL ESTABLISH DEMONSTRATION SYSTEM SPECIFICATIONS (INCLUDING LDMM SYSTEM SPECIFICATIONS) AND WILL ALSO INCLUDE A SCOPING LEVEL RETRIEVAL PERFORMANCE EVALUATION (RPE). THE FUNCTIONS AND REQUIREMENTS DOCUMENT AND ITS ASSOCIATED RPE SHALL PROVIDE ENVIRONMENTAL AND HUMAN HEALTH RISK EVALUATION DATA/INFORMATION ASSOCIATED WITH ESTIMATED WASTE VOLUMES TO BE RETRIEVED, THE MAXIMUM VOLUME WHICH COULD LEAK DURING RETRIEVAL, AND RISK FROM RESIDUAL WASTE. THIS DOCUMENT WILL DETAIL KNOWN AND ESTIMATED RADIONUCLIDE CONTAMINATION AND CONTAMINANT MIGRATION WITHIN THE VADOSE ZONE AS BASES OF CALCULATION. LDMM AND RPE DOCUMENTATION PROVIDED WILL BE ADEQUATE TO ALLOW ECOLOGY TO ASSESS THE ADEQUACY OF THE DEMONSTRATION SYSTEMS. THIS DOCUMENT WILL INCORPORATE LESSONS LEARNED, INCLUDING LDMM, RETRIEVAL, INSTRUMENTATION, AND OPERATIONAL EXPERIENCE FROM PREVIOUS DOE AND INDUSTRY RELATED RETRIEVAL PROJECTS. DOE WILL SUBMIT ITS C-104 LDMM STRATEGY AS PART OF THE FUNCTIONS AND REQUIREMENTS DOCUMENT, PRIOR TO INITIATION OF DESIGN. THIS DOCUMENT WILL BE SUBMITTED FOR ECOLOGY APPROVAL AS AN AGREEMENT PRIMARY DOCUMENT.</p> <p>THIS FUNCTIONS AND REQUIREMENTS DOCUMENT WILL BE TIMELY SUBMITTED IN A TIMELY FASHION SO THAT PROJECT CRITICAL PATH IS NOT AFFECTED, AND SO AS TO ALLOW ADEQUATE TIME FOR DOE AND ECOLOGY REVIEW, REVISION AND APPROVAL.</p>	12/31/2001
M-45-03G	<p>COMPLETE C-104 SLUDGE/HARD HEEL, CONFINED SLUICING AND ROBOTIC TECHNOLOGIES, WASTE RETRIEVAL COLD DEMONSTRATION.</p> <p>THIS FULL SCALE DEMONSTRATION WILL BE SUFFICIENT TO SUPPORT FINAL DESIGN AND TESTING OF ALL EQUIPMENT, INCLUDING THE LDMM APPROACH USED IN THE ACTUAL SYSTEM. THE DEMONSTRATION MUST ESTABLISH THE PERFORMANCE OF THE EQUIPMENT SPECIFIED IN THE FUNCTIONS AND REQUIREMENTS DOCUMENT. A LETTER REPORT WILL BE SUBMITTED TO ECOLOGY TO DOCUMENT THE RESULTS OF THE COLD DEMONSTRATION.</p>	6/30/2004
M-45-03H	<p>COMPLETE C-104 SLUDGE/HARD HEEL, CONFINED SLUICING AND ROBOTIC TECHNOLOGIES, WASTE RETRIEVAL DEMONSTRATION DESIGN (TO INCLUDE ALL PHYSICAL SYSTEMS INCLUDING DESIGN AND OPERATING STRATEGIES NECESSARY FOR LEAK DETECTION MONITORING AND MITIGATION (LDMM)).</p> <p>DESIGN WILL BE CONSIDERED COMPLETE WHEN 90% OF THE DESIGN HAS BEEN APPROVED FOR FABRICATION AND/OR CONSTRUCTION.</p>	9/30/2004
M-45-03I	<p>COMPLETE C-104 SLUDGE/HARD HEEL, CONFINED SLUICING AND ROBOTIC TECHNOLOGIES, WASTE RETRIEVAL DEMONSTRATION CONSTRUCTION (TO INCLUDE ALL PHYSICAL SYSTEMS INCLUDING THOSE NECESSARY FOR LEAK DETECTION MONITORING AND MITIGATION).</p> <p>CONSTRUCTION WILL BE CONSIDERED COMPLETE WHEN ALL PROCESS EQUIPMENT IS INSTALLED AND ACCEPTANCE TESTS ARE COMPLETED.</p>	9/30/2006
M-45-04-T01	<p>PROVIDE INITIAL SINGLE-SHELL TANK RETRIEVAL SYSTEMS.</p>	11/30/2003

Description/Justification of Change (Cont.)

	COMPLETE CONSTRUCTION AND RELATED TESTING OF THE INITIAL SST RETRIEVAL SYSTEMS. THIS MILESTONE WILL PROVIDE RETRIEVAL SYSTEMS FOR AN ENTIRE SINGLE SHELL TANK FARM OR AN EQUIVALENT NUMBER OF TANKS.	
M-45-04-T02	COMPLETE DESIGN FOR THE INITIAL SST RETRIEVAL SYSTEMS.	12/31/2000
M-45-04-T03	COMPLETE CONSTRUCTION FOR THE INITIAL SST RETRIEVAL SYSTEMS.	6/30/2003
M-45-05	RETRIEVE WASTE FROM ALL REMAINING SINGLE-SHELL TANKS. COMPLETE WASTE RETRIEVAL FROM ALL REMAINING SINGLE-SHELL TANKS. RETRIEVAL STANDARDS AND COMPLETION DEFINITIONS ARE PROVIDED UNDER THE MAJOR MILESTONE. THE SCHEDULE REFLECTS RETRIEVAL ACTIVITIES ON A FARM-BY-FARM BASIS. IT ALSO ALLOWS FLEXIBILITY TO RETRIEVE TANKS FROM VARIOUS FARMS IF DESIRED TO SUPPORT SAFETY ISSUE RESOLUTION, PRETREATMENT OR DISPOSAL FEED REQUIREMENTS, OR OTHER PRIORITIES.	9/30/2018
M-45-05-T01	INITIATE TANK WASTE RETRIEVAL FROM ONE SINGLE-SHELL TANK.	12/31/2003
M-45-05-T02	INITIATE TANK RETRIEVAL FROM TWO ADDITIONAL SINGLE-SHELL TANKS.	9/30/2004
M-45-05-T03	INITIATE TANK RETRIEVAL FROM THREE ADDITIONAL SINGLE-SHELL TANKS.	9/30/2005
M-45-05-T04	INITIATE TANK RETRIEVAL FROM FOUR ADDITIONAL SINGLE-SHELL TANKS.	9/30/2006
M-45-05A	COMPLETE INITIAL WASTE RETRIEVAL FROM TANK S-102. THE S-102 INITIAL WASTE RETRIEVAL TECHNOLOGY (OR TECHNOLOGIES) WILL BE SELECTED BASED ON THE PRINCIPLE CRITERIA OF MAXIMIZING THE RETRIEVAL OF MOBILE, LONG-LIVED RADIOISOTOPES AND NON-RADIOLOGICAL HAZARDOUS CONSTITUENTS. THE PARTIES RECOGNIZE AND AGREE THAT THIS ACTION IS FOR INITIAL WASTE RETRIEVAL PURPOSES. COMPLETION OF THIS INITIAL RETRIEVAL SHALL BE BY APPROVAL OF DOE AND ECOLOGY. GOALS OF THIS INITIAL WASTE RETRIEVAL PROJECT SHALL INCLUDE THE RETRIEVAL TO SAFE STORAGE OF APPROXIMATELY 490 CURIES OF MOBILE, LONG-LIVED RADIOISOTOPES AND 99% OF TANK CONTENTS BY VOLUME (PER DOE BEST-BASIS INVENTORY DATA, 8/01/2000). COMPLETION OF S-102 INITIAL WASTE RETRIEVAL IS SUBJECT TO SAFE STORAGE SPACE AVAILABILITY CONSISTENT WITH M-45-00B.	9/30/2006
M-45-05-T16	SUBMIT S-102 INITIAL WASTE RETRIEVAL FUNCTIONS AND REQUIREMENTS DOCUMENT. THIS DOCUMENT WILL ESTABLISH DEMONSTRATION SYSTEM SPECIFICATIONS (INCLUDING LDMM SYSTEM SPECIFICATIONS) AND WILL ALSO INCLUDE A SCOPING LEVEL RETRIEVAL PERFORMANCE EVALUATION (RPE). THE FUNCTIONS AND REQUIREMENTS DOCUMENT AND ITS ASSOCIATED RPE SHALL ALSO PROVIDE ENVIRONMENTAL AND HUMAN HEALTH RISK EVALUATION DATA/INFORMATION ASSOCIATED WITH ESTIMATED WASTE VOLUMES TO BE RETRIEVED, THE MAXIMUM VOLUME WHICH COULD LEAK DURING RETRIEVAL, AND RISK FROM RESIDUAL WASTE. THIS DOCUMENT WILL DETAIL KNOWN AND ESTIMATED RADIONUCLIDE CONTAMINATION AND CONTAMINANT MIGRATION WITHIN THE VADOSE ZONE AS BASES OF CALCULATION. LDMM AND RPE DOCUMENTATION PROVIDED WILL BE ADEQUATE TO ALLOW ECOLOGY TO ASSESS THE ADEQUACY OF THE DEMONSTRATION SYSTEMS. THIS DOCUMENT WILL INCORPORATE LESSONS LEARNED, INCLUDING LDMM, RETRIEVAL, INSTRUMENTATION, AND OPERATIONAL EXPERIENCE FROM PREVIOUS DOE AND INDUSTRY RELATED RETRIEVAL PROJECTS. DOE WILL SUBMIT ITS S-102 LDMM STRATEGY AS PART OF THE FUNCTIONS AND REQUIREMENTS DOCUMENT, PRIOR TO INITIATION OF DESIGN. THIS DOCUMENT WILL BE SUBMITTED FOR ECOLOGY APPROVAL AS AN AGREEMENT PRIMARY DOCUMENT.	10/30/2002

Description/Justification of Change (Cont.)

	THIS FUNCTIONS AND REQUIREMENTS DOCUMENT WILL BE TIMELY SUBMITTED IN A TIMELY FASHION SO THAT PROJECT CRITICAL PATH IS NOT AFFECTED, AND SO AS TO ALLOW ADEQUATE TIME FOR DOE AND ECOLOGY REVIEW, REVISION AND APPROVAL.	
M-45-05B	COMPLETE S-102 INITIAL RETRIEVAL PROJECT DESIGN (TO INCLUDE ALL PHYSICAL SYSTEMS INCLUDING DESIGN AND OPERATING STRATEGIES NECESSARY FOR LEAK DETECTION MONITORING AND MITIGATION (LDMM)) THE DESIGN WILL BE CONSIDERED COMPLETE WHEN 90% OF THE DESIGN HAS BEEN APPROVED FOR FABRICATION AND/OR CONSTRUCTION.	3/31/2004
M-45-05C	COMPLETE S-102 INITIAL WASTE RETRIEVAL PROJECT CONSTRUCTION (TO INCLUDE ALL PHYSICAL SYSTEMS INCLUDING THOSE NECESSARY FOR LEAK DETECTION MONITORING AND MITIGATION). CONSTRUCTION WILL BE CONSIDERED COMPLETE WHEN ALL PROCESS EQUIPMENT IS INSTALLED AND ACCEPTANCE TESTS ARE COMPLETED.	11/30/2005
M-45-05D	ESTABLISH COMPLETION DATE FOR THE SECOND TANK, INITIAL WASTE RETRIEVAL. THIS SECOND FULL SCALE INITIAL WASTE RETRIEVAL PROJECT WILL BE CONDUCTED UNDER THE ONGOING CRITERIA OF MAXIMIZING THE RETRIEVAL TO SAFE STORAGE OF MOBILE, LONG LIVED RADIOISOTOPES AND PRINCIPLE NON-RADIOLOGICAL HAZARDOUS CONSTITUENTS. COMPLETION OF THIS INITIAL RETRIEVAL MILESTONE SHALL BE BY APPROVAL OF DOE AND ECOLOGY.	12/31/2002
M-45-05-T17	SUBMIT SECOND TANK INITIAL WASTE RETRIEVAL FUNCTIONS AND REQUIREMENTS DOCUMENT. THIS DOCUMENT WILL ESTABLISH DEMONSTRATION SYSTEM SPECIFICATIONS (INCLUDING LDMM SYSTEM SPECIFICATIONS) AND WILL ALSO INCLUDE A SCOPING LEVEL RETRIEVAL PERFORMANCE EVALUATION (RPE). THE FUNCTIONS AND REQUIREMENTS DOCUMENT AND ITS ASSOCIATED RPE SHALL ALSO PROVIDE ENVIRONMENTAL AND HUMAN HEALTH RISK EVALUATION DATA/INFORMATION ASSOCIATED WITH ESTIMATED WASTE VOLUMES TO BE RETRIEVED, THE MAXIMUM VOLUME WHICH COULD LEAK DURING RETRIEVAL, AND RISK FROM RESIDUAL WASTE. THIS DOCUMENT WILL DETAIL KNOWN AND ESTIMATED RADIONUCLIDE CONTAMINATION AND CONTAMINANT MIGRATION WITHIN THE VADOSE ZONE AS BASES OF CALCULATION. LDMM AND RPE DOCUMENTATION PROVIDED WILL BE ADEQUATE TO ALLOW ECOLOGY TO ASSESS THE ADEQUACY OF THE DEMONSTRATION SYSTEMS. THIS DOCUMENT WILL INCORPORATE LESSONS LEARNED, INCLUDING LDMM, RETRIEVAL, INSTRUMENTATION, AND OPERATIONAL EXPERIENCE FROM PREVIOUS DOE AND INDUSTRY RELATED RETRIEVAL PROJECTS. DOE WILL SUBMIT ITS LDMM STRATEGY AS PART OF THE FUNCTIONS AND REQUIREMENTS DOCUMENT, PRIOR TO INITIATION OF DESIGN. THIS DOCUMENT WILL BE SUBMITTED FOR ECOLOGY APPROVAL AS AN AGREEMENT PRIMARY DOCUMENT. THIS FUNCTIONS AND REQUIREMENTS DOCUMENT WILL BE TIMELY SUBMITTED IN A TIMELY FASHION SO THAT PROJECT CRITICAL PATH IS NOT AFFECTED, AND SO AS TO ALLOW ADEQUATE TIME FOR DOE AND ECOLOGY REVIEW, REVISION AND APPROVAL.	4/30/2004
M-45-05E	COMPLETE SECOND TANK INITIAL RETRIEVAL PROJECT DESIGN (TO INCLUDE ALL PHYSICAL SYSTEMS INCLUDING DESIGN AND OPERATING STRATEGIES NECESSARY FOR LEAK DETECTION MONITORING AND MITIGATION (LDMM)). THE DESIGN WILL BE CONSIDERED COMPLETE WHEN 90% OF THE DESIGN HAS BEEN APPROVED FOR FABRICATION AND/OR CONSTRUCTION.	6/30/2006
M-45-05F	COMPLETE SECOND INITIAL WASTE RETRIEVAL PROJECT CONSTRUCTION (TO INCLUDE ALL PHYSICAL SYSTEMS INCLUDING THOSE NECESSARY FOR LEAK DETECTION MONITORING AND MITIGATION).	TBE (Specific tank identification and this milestone date shall be established no

Description/Justification of Change (Cont.)

	CONSTRUCTION WILL BE CONSIDERED COMPLETE WHEN ALL PROCESS EQUIPMENT IS INSTALLED AND ACCEPTANCE TESTS ARE COMPLETED.	later than 12/31/02.)
M-45-05-T05	INITIATE TANK RETRIEVAL FROM FIVE ADDITIONAL SINGLE-SHELL TANKS.	9/30/2007
M-45-05-T06	INITIATE TANK RETRIEVAL FROM FIVE ADDITIONAL SINGLE-SHELL TANKS.	9/30/2008
M-45-05-T07	INITIATE TANK RETRIEVAL FROM SEVEN ADDITIONAL SINGLE-SHELL TANKS.	9/30/2009
M-45-05-T08	INITIATE TANK RETRIEVAL FROM EIGHT ADDITIONAL SINGLE-SHELL TANKS.	9/30/2010
M-45-00C M-45-00D	<p>COMPLETE RENEGOTIATION OF THE REMAINDER OF THE SST WASTE RETRIEVAL AND CLOSURE PROGRAM.</p> <p>THESE NEGOTIATIONS WILL ESTABLISH REGULATORY REQUIREMENTS FOR THE REMAINDER OF THE SST WASTE RETRIEVAL AND CLOSURE PROGRAM (THROUGH COMPLETION OF CLOSURE AT ALL SINGLE SHELL TANK FARMS). NEGOTIATIONS WILL INCLUDE MODIFICATION AS MAY BE NECESSARY OF COMPLETION DATES FOR SST WASTE RETRIEVAL AND SST FARM CLOSURE BASED ON EXPERIENCE GAINED FROM SST AND DST WASTE RETRIEVAL WORK COMPLETED, CORRECTIVE ACTIONS, PHASE I TREATMENT COMPLEX OPERATIONS, PHASE II TREATMENT PLANNING, KNOWN AND LIKELY VADOSE ZONE AND GROUNDWATER IMPACTS, AND OTHER AVAILABLE ENVIRONMENTAL IMPACT INFORMATION.</p> <p>DOE, AND DOE'S CONTRACTOR(S) WILL RETRIEVE AND TRANSFER SST WASTES INTO THE DST SYSTEM AS SOON AS SPACE IS MADE AVAILABLE, ALLOWING DST SPACE FOR TREATMENT PLANT FEED STAGING AND SAFETY ISSUE RESOLUTION. TRANSFER OF SST WASTE WILL BE MADE ONCE SUFFICIENT DST SYSTEM SPACE IS AVAILABLE TO ALLOW A TRANSFER OF AN OPERATIONALLY PRACTICABLE VOLUME OF WASTE. SST WASTE WILL BE RETRIEVED ON A PRIORITY BASIS WITH THE GOALS OF REDUCING ENVIRONMENTAL RISK AND TREATMENT PROCESS OPTIMIZATION. DOE AND ECOLOGY WILL AGREE ON THE CRITERIA TO DETERMINE ENVIRONMENTAL RISK REDUCTION.</p>	6/30/2011
M-45-05-T09	INITIATE TANK RETRIEVAL FROM TEN ADDITIONAL SINGLE-SHELL TANKS.	9/30/2011
M-45-05-T10	INITIATE TANK RETRIEVAL FROM 12 ADDITIONAL SINGLE-SHELL TANKS.	9/30/2012
M-45-05-T11	INITIATE TANK RETRIEVAL FROM 14 ADDITIONAL SINGLE-SHELL TANKS.	9/30/2013
M-45-05-T12	INITIATE TANK RETRIEVAL FROM 17 ADDITIONAL SINGLE-SHELL TANKS.	9/30/2014
M-45-05-T13	INITIATE TANK RETRIEVAL FROM 20 ADDITIONAL SINGLE-SHELL TANKS.	9/30/2015
M-45-05-T14	INITIATE TANK RETRIEVAL FROM 20 ADDITIONAL SINGLE-SHELL TANKS.	9/30/2016
M-45-05-T15	INITIATE TANK RETRIEVAL FROM 20 ADDITIONAL SINGLE-SHELL TANKS.	9/30/2017
M-45-06	<p>COMPLETE CLOSURE OF ALL SINGLE-SHELL TANK FARMS IN ACCORDANCE WITH APPROVED CLOSURE/POST CLOSURE PLAN(S).</p> <p>THE SINGLE-SHELL TANK CLOSURE WORK PLAN WILL BE PREPARED DESCRIBING THE WORK INTEGRATION PROCESS FOR SINGLE-SHELL TANK CLOSURES AND STATUS OF WORK AND INTEGRATION PROCESS. KNOWN ISSUES WILL BE IDENTIFIED AND AN EXPLANATION WILL BE GIVEN ON HOW THESE ISSUES ARE BEING ADDRESSED. THIS WORK PLAN WILL BE PROVIDED TO ECOLOGY FOR REVIEW/COMMENT AND WILL BE USED AS A ROADMAP FOR CLOSURE OF THE SINGLE-SHELL TANKS. BECAUSE OF THE UNCERTAINTIES IN THE CLOSURE PROCESS, THE WORK PLAN WILL EVOLVE AS THESE UNCERTAINTIES ARE RESOLVED AND EVENTUALLY IT WILL BECOME THE SST CLOSURE/POST CLOSURE PLAN(S) ISSUED FOR ECOLOGY'S APPROVAL UNDER SUBSEQUENT TPA INTERIM MILESTONES. MAJOR WORK AREAS COVERED IN THE WORK PLAN WILL INCLUDE WASTE RETRIEVAL, OPERABLE UNITS CHARACTERIZATION,</p>	9/30/2024

Description/Justification of Change (Cont.)

	TECHNOLOGIES DEVELOPMENT TO SUPPORT CLOSURE, REGULATORY PATHWAY AND STRATEGY FOR ACHIEVING CLOSURE.	
M-45-06-T01	SUBMIT TANK CLOSURE/POST CLOSURE PLAN FOR SELECTED CLOSURE DEMONSTRATION OPERABLE UNIT OR TANK FARM TO ECOLOGY FOR APPROVAL.	11/30/2004
M-45-06-T05	<p>SUBMIT TANK FARM CLOSURE/POST-CLOSURE WORKPLAN UPDATE.</p> <p>BECAUSE OF THE UNCERTAINTIES IN THE CLOSURE PROCESS, THE WORK PLAN WILL EVOLVE AS THESE UNCERTAINTIES ARE RESOLVED AND EVENTUALLY IT WILL BECOME THE SST CLOSURE/POST CLOSURE PLAN(S) ISSUED FOR ECOLOGY'S APPROVAL UNDER SUBSEQUENT TPA INTERIM MILESTONES. MAJOR WORK AREAS COVERED IN THE WORK PLAN WILL INCLUDE WASTE RETRIEVAL, OPERABLE UNITS CHARACTERIZATION, TECHNOLOGIES DEVELOPMENT TO SUPPORT CLOSURE, REGULATORY PATHWAY AND STRATEGY FOR ACHIEVING CLOSURE.</p> <p>THIS UPDATE OF THE MAY 1996 CLOSURE WORKPLAN WILL INCLUDE, BUT IS NOT LIMITED TO THE INCORPORATION OF:</p> <ul style="list-style-type: none"> • DATA ACQUIRED DURING THE C-106 RETRIEVAL PROJECT (COMPLETED DURING FY2000), • RESULTS FROM RECENT ACTIVITIES FOCUSING ON MAXIMIZING RISK REDUCTION, • INFORMATION OBTAINED VIA VADOSE ZONE, GROUNDWATER MONITORING, AND RFI/CMS PROCESSES, AND • LESSONS LEARNED FROM THE AX FARM RPE. <p>DOE'S TANK FARM CLOSURE/POST-CLOSURE WORKPLAN UPDATE WILL BE SUBMITTED TO ECOLOGY AS A PRIMARY DOCUMENT.</p>	6/30/2002
M-45-06-T06	<p>SUBMIT TANK FARM CLOSURE/POST CLOSURE WORKPLAN UPDATE.</p> <p>THIS UPDATE OF THE 6/30/02 CLOSURE WORKPLAN WILL INCLUDE, BUT IS NOT LIMITED TO THE INCORPORATION OF:</p> <ul style="list-style-type: none"> • NEWLY AVAILABLE DATA, • A MORE DETAILED ASSESSMENT OF THE POINT OF COMPLIANCE AND RISK INFORMATION, • UPDATED DATA FROM VADOSE ZONE AND GROUNDWATER CHARACTERIZATION AND MONITORING, • NEW INFORMATION FROM M-45 SERIES RETRIEVAL ACTIONS COMPLETED TO DATE. <p>THE CLOSURE/POST CLOSURE WORKPLAN WILL BE SUBMITTED TO ECOLOGY AS A PRIMARY DOCUMENT.</p>	6/30/2004
M-45-06-T07	<p>SUBMIT TANK FARM CLOSURE/POST CLOSURE WORKPLAN UPDATE.</p> <p>THIS UPDATE OF THE 6/30/04 CLOSURE WORKPLAN WILL INCLUDE, BUT IS NOT LIMITED TO THE INCORPORATION OF:</p> <ul style="list-style-type: none"> • DATA OBTAINED FROM THE "LIMITS OF TECHNOLOGY" SALTCAKE TANK RETRIEVAL TECHNOLOGY DEMONSTRATION, • RESULTS FROM OTHER SST RETRIEVAL ACTIVITIES, • UPDATED DATA FROM VADOSE ZONE AND GROUNDWATER CHARACTERIZATION AND MONITORING, • RIVER PROTECTION PROJECT AGREEMENT REQUIREMENTS, INCLUDING WASTE TREATMENT COMPLEX PROCESSING CAPABILITY, <p>CLOSURE/POSTCLOSURE WORKPLANS WILL BE SUBMITTED TO ECOLOGY AS PRIMARY DOCUMENTS.</p>	6/30/2006 (And every two years thereafter)
M-45-06-T02	ECOLOGY WILL ISSUE FINAL CLOSURE/POST CLOSURE PLAN FOR SELECTED CLOSURE DEMONSTRATION OPERABLE UNIT OR TANK FARM.	9/30/2006

Description/Justification of Change (Cont.)

M-45-06-T03	INITIATE CLOSURE ACTIONS ON AN OPERABLE UNIT OR TANK FARM BASIS. CLOSURE SHALL FOLLOW COMPLETION OF THE RETRIEVAL ACTIONS UNDER PROPOSED MILESTONE M-45-05. CLOSURE WILL BE DEFINED IN AN APPROVED CLOSURE PLAN FOR THE DEMONSTRATION FARM. FINAL CLOSURE IS DEFINED AS REGULATORY APPROVAL OF COMPLETION OF CLOSURE ACTIONS.	3/31/2012
M-45-06-T04	COMPLETE CLOSURE ACTIONS ON ONE OPERABLE UNIT OR TANK FARM.	3/31/2014
M-45-08	ESTABLISH FULL SCALE CAPABILITY FOR MITIGATION OF WASTE TANK LEAKAGE DURING RETRIEVAL SLUICING OPERATIONS.	6/30/2003
M-45-08A	COMPLETE SYSTEM DESIGN AND OPERATING STRATEGY FOR TANK LEAK MONITORING AND MITIGATION FOR SYSTEMS TO BE USED IN CONJUNCTION WITH INITIAL RETRIEVAL SYSTEMS FOR SSTs.	12/31/2000
M-45-08B	COMPLETE DEMONSTRATION AND INSTALLATION OF LEAK MONITORING AND MITIGATION SYSTEMS FOR INITIAL SST RETRIEVAL.	6/30/2003
M-45-09E	SUBMIT ANNUAL PROGRESS REPORTS ON THE DEVELOPMENT OF WASTE TANK LEAK MONITORING/DETECTION AND MITIGATION ACTIVITIES IN SUPPORT OF M-45-08. REPORTS WILL PROVIDE A DESCRIPTION OF WORK ACCOMPLISHED UNDER M-45-08, TECHNOLOGIES, APPLICATIONS, COST SCHEDULE, AND TECHNICAL DATA. REPORTS WILL ALSO EVALUATE DEMONSTRATIONS PERFORMED BY DOE AND PRIVATE INDUSTRY FOR APPLICABILITY TO SST RETRIEVAL AND PROVIDE RECOMMENDATIONS FOR FURTHER TESTING FOR USE IN RETRIEVAL OPERATIONS.	9/30/2000
M-45-09F	SUBMIT ANNUAL PROGRESS REPORTS ON THE DEVELOPMENT OF WASTE TANK LEAK MONITORING/DETECTION AND MITIGATION ACTIVITIES IN SUPPORT OF M-45-08. REPORTS WILL PROVIDE A DESCRIPTION OF WORK ACCOMPLISHED UNDER M-45-08, TECHNOLOGIES, APPLICATIONS, COST, SCHEDULE, AND TECHNICAL DATA. REPORTS WILL ALSO EVALUATE DEMONSTRATIONS PERFORMED BY DOE AND PRIVATE INDUSTRY FOR APPLICABILITY TO SST RETRIEVAL AND PROVIDE RECOMMENDATIONS FOR FURTHER TESTING FOR USE IN RETRIEVAL OPERATIONS.	9/30/2001
M-45-09G	SUBMIT ANNUAL PROGRESS REPORTS ON THE DEVELOPMENT OF WASTE TANK LEAK MONITORING/DETECTION AND MITIGATION ACTIVITIES IN SUPPORT OF M-45-08. REPORTS WILL PROVIDE A DESCRIPTION OF WORK ACCOMPLISHED UNDER M-45-08, TECHNOLOGIES, APPLICATIONS, COST, SCHEDULE, AND TECHNICAL DATA. REPORTS WILL ALSO EVALUATE DEMONSTRATIONS PERFORMED BY DOE AND PRIVATE INDUSTRY FOR APPLICABILITY TO SST RETRIEVAL AND PROVIDE RECOMMENDATIONS FOR FURTHER TESTING FOR USE IN RETRIEVAL OPERATIONS.	9/30/2002
M-45-09H	SUBMIT ANNUAL PROGRESS REPORTS ON THE DEVELOPMENT OF WASTE TANK LEAK MONITORING/DETECTION AND MITIGATION ACTIVITIES IN SUPPORT OF M-45-08. REPORTS WILL PROVIDE A DESCRIPTION OF WORK ACCOMPLISHED UNDER M-45-08, TECHNOLOGIES, APPLICATIONS, COST, SCHEDULE, AND TECHNICAL DATA. REPORTS WILL ALSO EVALUATE DEMONSTRATIONS PERFORMED BY DOE AND PRIVATE INDUSTRY FOR APPLICABILITY TO SST RETRIEVAL AND PROVIDE RECOMMENDATIONS FOR FURTHER TESTING FOR USE IN RETRIEVAL OPERATIONS.	9/30/2003 and annually thereafter
M-45-12-T01	SUBMIT AN OPTIONS REPORT DOCUMENTING DOE ASSESSMENT OF ACTIONS THAT COULD BE TAKEN TO INCREASE AVAILABLE TANK SPACE FOR SST WASTE RETRIEVAL.	2/28/2002

Description/Justification of Change (Cont.)

	<p>THIS REPORT WILL EVALUATE AND DOCUMENT OPTIONS FOR ACQUIRING ADDITIONAL STORAGE SPACE FOR SST RETRIEVAL IN ADDITION TO THAT REQUIRED UNDER THIS M-45-00-01A CHANGE REQUEST. PRINCIPLE ACTIONS REQUIRED TO IMPLEMENT EACH OPTION WITHIN A REASONABLE TIME WILL BE IDENTIFIED. THE PRINCIPLE OPTIONS WILL HAVE DETAILED COST AND SCHEDULES FOR IMPLEMENTATION.</p>	
--	---	--

00-01A August 30.doc

APPENDIX TO CHANGE REQUEST M-45-93-01 H – SINGLE SHELL TANK WASTE RETRIEVAL CRITERIA PROCEDURE

Note: This procedure was originally appended to Agreement Change Request M-45-93-01, but will now be added as Appendix H to the Agreement. The ~~strikeout~~ and ~~shading~~ represent text to be deleted and added to the original procedure.

SINGLE SHELL TANK WASTE RETRIEVAL CRITERIA PROCEDURE¹

INTRODUCTION

The purpose of this procedure is to establish a means to set, evaluate, and revise criteria for determining the allowable residual waste following waste retrieval operations on the Hanford single shell tanks (SST).

The format for this procedure is to progress through a series of steps as depicted in the generic logic diagram displayed as Figure 1. Each step is briefly outlined and includes elements that constitute completion of the step.

DEFINITION OF TERMS SPECIFIC TO WASTE RETRIEVAL ACTIVITIES:

Residual Waste: Tank waste remaining in the tank after all waste retrieval actions have been completed. Some materials may be excluded from residual waste volume calculations, subject to approval in the closure plan.

Step 1 : Establish Goal

This initial step establishes the goal (the standard) for waste retrieval percentage and the method to be used to calculate the allowable residual waste volume following completion of retrieval operations. The calculation method is dependent on the variable to be measured (total tank waste inventory), and closure criteria and strategy. The proposed residual waste volume calculation method is shown in Attachment 1. A retrieval goal has been established as defined in milestone M-45-00.

Step 2 : Evaluate Major Assessment Areas

Once the goal has been established, it is assessed against two major areas, which are:

- a) **SST Demonstration:** Demonstrate achievability of waste retrieval goal during tank 241-S-112 and 241-C-1046 tank retrieval demonstrations. These will demonstrate retrieval of both saltcake and sludge/hard heel wastes as well as tanks in both 200 East and 200 West areas. Experience gained during AX-104, C-106 and earlier past practice sluicing shall be the reference baseline for past practice sluicing. ~~Demonstrations will include the reference SST retrieval technologies.~~ The effectiveness of the retrieval operation will be determined with a topographical measurement of remaining waste in the tank, and a

¹ This procedure was originally appended to Change Request M-45-93-01

APPENDIX TO CHANGE REQUEST M-45-93-01 H - SINGLE SHELL TANK WASTE RETRIEVAL CRITERIA PROCEDURE

calculation of waste inventory. The inventory calculation will be based on calculated volume of the tank, waste topography measurements with appropriate surveying techniques, and include adjustments for any detectable deformities in the tank structure (i.e., liner bulges). This technique will be demonstrated and calibrated in this retrieval demonstration. Prepare input to the retrieval goal evaluation (step 3) to accommodate the retrieval operations and residual measurement demonstrations.

- b) Evaluate regulatory requirements of high-level waste (HLW) disposal from applicable rules, regulations and DOE Orders and the Nuclear Waste Policy Act (NWPA). Establish an interface with the Nuclear Regulatory Commission (NRC), and reach formal agreement on the retrieval and closure actions for single shell tanks with respect to allowable waste residuals in the tank and soil column. Prepare input to the retrieval goal evaluation (step 3) to accommodate the agreements on allowable residuals.

Step 3 : Tank Retrieval Demonstration Goal Compliance

Perform a joint assessment by DOE, EPA, and Ecology of the retrieval goal, based on the inputs from Steps 1 and 2. Modify the retrieval goal to match the most restrictive case (i.e., the highest retrieval % requirement).

Step 4 : Tank Farm Retrieval Demonstration(s)

Perform the Tank Farm Retrieval Demonstration(s) on the selected tank farm or initial set of single-shell tanks to be retrieved. Repeat the residual inventory measurement steps identified in the tank retrieval demonstration. Calculate the residual inventory for each tank, based on the formula and procedure in Attachment 1 to this Appendix.

Step 5 : Tank Farm Retrieval Demonstration Goal Compliance

Perform a joint assessment by DOE, EPA, and Ecology of the retrieval goal, based on the tank farm retrieval demonstration results. Modify the goal to match best available technology. Notify NRC as required for compliance with Nuclear Waste Policy Act WPA. Establish formal criteria for retrieval of waste from the remaining SST's. Finalize closure plans for tank farms and obtain concurrence from regulatory agencies.

Step 6 : SST Retrieval

Proceed with retrieval of waste from the remaining SSTs. The schedule reflects retrieval activities on a tank-by-tank basis. It also allows flexibility to retrieve tanks from various farms if desired to support safety issue resolution, pretreatment or disposal feed requirements, or other priorities. Completion of retrieval will be in accordance with approved closure plans.

**APPENDIX TO CHANGE REQUEST M-45-93-01 II – SINGLE SHELL TANK WASTE
RETRIEVAL CRITERIA PROCEDURE**

Step 7 : Determine Residual Waste Percentage

The waste residuals are calculated for each tank.

Step 8 : Retrieval Compliance Evaluation

Compare residual waste in each tank with criteria. Document compliance with criteria via notification to appropriate regulatory agencies. If residual complies with criteria, proceed with final closure operations (step 14). If residuals do not comply with criteria, prepare a request for waiver to the appropriate regulatory agency (step 9).

Step 9 : Petition for Regulatory Waiver

An assessment is made as to the applicability of petitioning for regulatory waiver. This requires the review of relevant NRC license issues and possible closure plan modifications. Submit waivers to appropriate regulatory agencies.

Step 10 : Waiver Acceptance

If a waiver is accepted, closure operations for the tank farm is initiated (Step 14). If the waiver is not accepted, additional retrieval operations are required. New technology may be needed (step 11). The waiver evaluation will consider the points on Attachment 2.

Step 11 : Additional Technology Available

A review of alternate technologies will be performed relative to additional waste removal. If additional technologies are available, they will be deployed (step 12) and waste retrieval will resume. If additional technologies are not available, new technologies must be developed and deployed (steps 13 and 14). The tank farm will be held in interim status pending completion of the additional retrieval operations.

Step 12 : Deploy Technology and Perform Additional Retrieval

If additional retrieval technology is available, it is deployed and additional waste retrieval operations are performed. After retrieval operation, the waste residual is again determined (Step 7), followed by the tank goal compliance evaluation (Step 8).

Step 13 : Develop New Technology

If additional retrieval technology is not available, new technology is to be developed for the residue waste followed by deployment of the technology and additional waste retrieval operations (Step 12). After retrieval operation, the waste residual is again determined (Step 7), followed by the tank goal compliance evaluation (Step 8).

**APPENDIX TO CHANGE REQUEST M-45-93-01 H - SINGLE SHELL TANK WASTE
RETRIEVAL CRITERIA PROCEDURE**

Step 14 : Closure Action

When the tank farm retrieval and waste residual assessment process is complete the closure operations will start. Completion of the retrieval operations will be documented in accordance with the closure plans.

**APPENDIX TO CHANGE REQUEST M-45-93-01 H - SINGLE SHELL TANK WASTE
RETRIEVAL CRITERIA PROCEDURE**

Attachment 1

WASTE RESIDUAL CALCULATION PROCEDURE, STEP 1

Calculate Residual Waste Volume

1. Calculate Tank Volume
2. Measure/Calculate Waste Inventory via Topographical Mapping and Survey Techniques.
3. Retrieve Waste
4. Repeat Step 2.

Calculation Method:

For 75' Diameter Tanks (x) (Full Diameter Tank (x)), i.e., 100 Series Tanks

$$\begin{aligned} \text{xbar gal} &= (100-A)\% \left(\frac{\text{Total Volume of Waste}}{133 \text{ Tanks}} \right) = \text{Allowable Average Residual} \\ &\quad \text{in full diameter tanks} \qquad \qquad \qquad \text{per Tank} \\ &= (100-99)(4,788,000 \text{ cu ft})/133 = 360 \text{ cu ft} \end{aligned}$$

where A% * = Goal or criteria for waste retrieval percentage.

For Small Diameter Tank (y), e.g., 200 Series Tanks

$$\begin{aligned} \text{ybar gal} &= (100-A)\% \left(\frac{\text{Total Volume of Waste}}{16 \text{ Tanks}} \right) = \text{Allowable Average Residual} \\ &\quad \text{in small diameter tanks} \qquad \qquad \qquad \text{per Tank} \\ &= (100-99)(48,000 \text{ cu ft}/16) = 30 \text{ cu ft} \end{aligned}$$

where A% * = Goal or criteria for waste retrieval percentage.

* Goal is 99% waste retrieval as defined in M-45-00 in equivalent volumetric measures.

**APPENDIX TO CHANGE REQUEST M-45-93-01 H - SINGLE SHELL TANK WASTE
RETRIEVAL CRITERIA PROCEDURE**

Attachment 2

EXCEPTION TO RETRIEVAL CRITERIA FOR SINGLE-SHELL TANKS

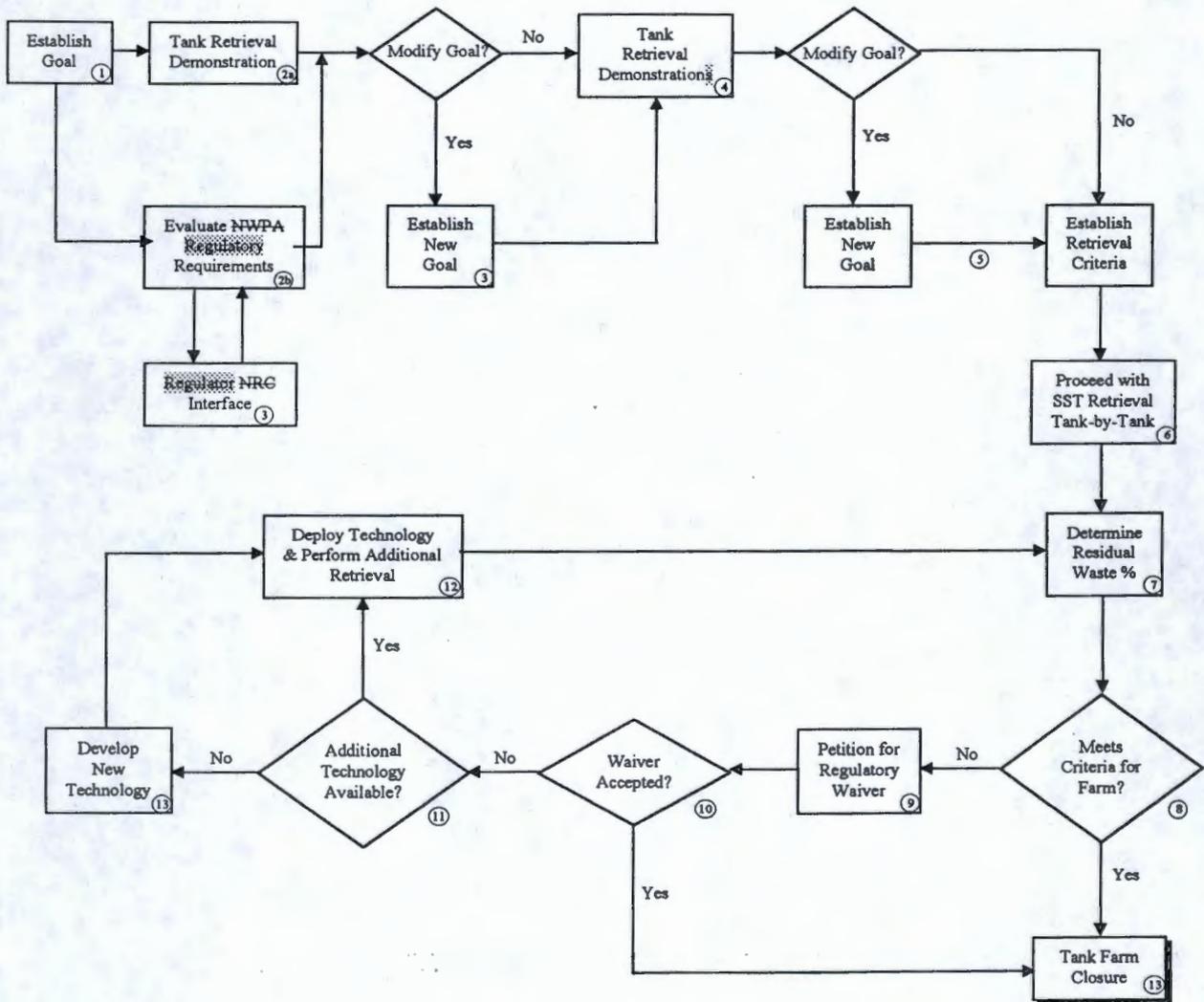
The DOE shall retrieve tank waste in accordance with criteria defined in milestone M-45-00. This recovery criteria will be applied to each tank on a tank-by-tank basis. If the DOE does not believe that this criteria is achievable for a specific tank, DOE shall submit a request for an exception to EPA and Ecology. The request shall include, at minimum, the following information:

1. The reason DOE does not believe the retrieval criteria can be met.
2. The schedule, using existing technology, to complete retrieval to the criteria - if possible.
3. The potential for future retrieval technology developments that could achieve the criteria, including estimated schedules and costs for development and deployment.
4. The volume of waste proposed to be left in place, and it's chemical and radiological characteristics.
5. Expected impacts to human health and the environment if the residual waste is left in place.
6. Additional information as required by EPA and/or Ecology.

The above information shall be submitted within 120 days of the decision by DOE that continued retrieval actions will not result in further waste removal. Upon receipt, EPA and Ecology shall provide a response within 60 days, in which they will either approve the exception to the criteria, in which case retrieval will be considered complete for the tanks in question, or they will deny the request. If the request is denied the DOE must continue to attempt to retrieve the tank wastes until the criteria is met for the tank, or they may choose to enter into the RCRA dispute resolution procedures of the Agreement. If an exception to the criteria is approved, the closure plan for the SSTs must be modified to address the remaining residual waste.

**APPENDIX TO CHANGE REQUEST M-45-93-01 H - SINGLE SHELL TANK WASTE
RETRIEVAL CRITERIA PROCEDURE**

Figure 1. Process for Assessing Percentage of Waste Retrieved from Waste Retrieval Operations



**Hanford Federal Facility Agreement and
Consent Order**

Comments and Responses to the Tentative Agreement Regarding

Change Request M-45-00-01A

Modification of Hanford Federal Facility Agreement and Consent Order (Agreement) provisions governing near term Single Shell Tank waste retrieval activities necessary for compliance with Washington's Hazardous Waste Management Act (HWMA).

**COMMENTS AND RESPONSES
TO THE TENTATIVE AGREEMENT
REGARDING CHANGE REQUEST
M-45-00-01A**

COMMENTS AND RESPONSES

1. Introduction

The Washington State Department of Ecology (Ecology) and the U.S. Department of Energy (Energy) have completed review of comments received during public review of the agencies' proposed modifications in Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement or TPA) Change Request M-45-00-01A: "Modification of Hanford Federal Facility Agreement and Consent Order (Agreement) provisions governing near term Single Shell Tank waste retrieval activities necessary for compliance with Washington's Hazardous Waste Management Act (HWMA)". As a result of this review, the parties' proposed modification has been revised as noted in the following text and has been incorporated within the Tri-Party Agreement.

2. Background

The DOE Office of River Protection's mission is to safely store, retrieve, treat, and dispose of Hanford's 53 million gallons of high-level and hazardous waste presently contained in 177 aging underground tanks at Hanford. These tanks are regulated under Washington States Hazardous Waste Management Act. The 149 single-shell tanks (SSTs) do not meet Washington Administrative Code / Resource Conservation and Recovery Act requirements e.g. they do not have adequate leak detection devices and do not have a double wall to contain the waste. The tank waste was produced during World War II and the Cold War to process plutonium.

The proposed modification deletes general and non-enforceable schedules within the current Tri-Party Agreement, and replaces them with specific enforceable requirements. These requirements include technology development and demonstration activities for SST waste retrieval and transfer of waste from the SST system into DOE's double-shell tank (DST) system. These activities are critical to ensure the retrieval of waste from SSTs in a timely and cost-effective manner.

Initial Plan: The Hanford Site single-shell tanks contain approximately 35 million gallons of waste, which must be retrieved from single-shell tanks and transferred to double-shell tanks. In 1994, the Tri-Party Agreement was amended to specify that DOE would retrieve waste from single-shell tanks beginning in 2003 and initiate retrieval from 10 single-shell tanks by 2006. Waste would be retrieved from the remaining tanks by 2018. The Tri-Party Agreement did not specify retrieval technologies, however, it did recognize that waste retrieval from aging single-shell tanks posed technical challenges including the potential for loss of waste to the environment. These challenges would require DOE to demonstrate alternative retrieval technologies and develop and test methods to detect, monitor, and mitigate potential leaks during waste retrieval. In 1999, DOE completed interim waste retrieval from tank C-106. This retrieval action resolved a high-heat safety issue and demonstrated the use of "past-practice" sluicing to retrieve waste from a single-shell tank.

The ability to retrieve waste from single-shell tanks is contingent on the availability of DST space. Initial plans for waste retrieval were based, in part, on the startup of a waste treatment facility that was scheduled for late 2002. Under that scenario, as waste was removed from DSTs for waste immobilization space would become available to support single-shell tank waste retrieval. Unfortunately, the startup date for a waste treatment facility has been delayed until late 2007. This delay constrains the ability to initiate bulk waste retrieval from single-shell tanks (available DST storage space is limited).

Principal Issues: Due to limited DST storage space Ecology and DOE's Office of River Protection have agreed to retrieve waste from fewer SSTs that contain more hazardous long-lived radioactive waste, instead of retrieving waste from 10 relatively empty SSTs. The Tri-Parties' tentative agreement establishes a risk-based strategy and initial actions necessary for DOE to demonstrate alternative single-shell tank waste retrieval technologies. The technologies are suitable to use in suspect or leaking SSTs to minimize the potential for large leak losses to the environment, and to develop performance and cost data necessary for application to future retrieval actions. These initial retrievals also include development and demonstration of leak detection, monitoring, and mitigation methods. In addition to demonstrating waste retrieval technologies, the initial actions will focus on single-shell tanks that pose the greatest risk to the environment and on maximizing available DST space. These initial actions and the information they provide regarding the capability of a variety of waste retrieval technologies will aid the parties during the negotiation of Tri-Party Agreement commitments and future retrieval actions.

The New Strategy: Key elements of the proposed milestone change include:

- Implement a risk-reduction strategy for SST waste retrieval ("worst tank waste" first).
- Demonstration of single-shell tank waste retrieval and leak detection, monitoring and mitigation technologies.
- Transfer of no less than 800 curies of long-lived, mobile radionuclides into approximately 2 million gallons of DST space for retrieval of S-112 and S-102.
- Complete construction for tank C-104 retrieval action which will transfer approximately 23,000 curies of plutonium {approximately 17% of the total plutonium inventory in SSTs} into approximately 800,000 gallons of DST space.
- Update of the tank closure work plans.
- Assessment of options to create more tank space.

Future negotiations are scheduled in 2004 for SST waste retrieval activities after 2006. Information learned from these retrieval demonstrations will establish any appropriate schedule adjustments.

3. Public Comment Period

Negotiation of a tentative agreement between the parties on this matter was reached on August 30, 2000. A public comment period on the resulting proposed changes was then opened on October 2, 2000 and concluded on November 17, 2000.

COMMENTS RECEIVED AND AGENCY RESPONSES ON CHANGE REQUEST M-45-00-01A

1.

Commenter: M. L. Blazek, Oregon Office of Energy

Comment 1: The Single Shell Tanks (SST) from which the liquids were pumped were carefully selected to achieve the maximum risk reduction possible given the circumstances. The Double Shell Tanks

(DST) to which the SST contents will be pumped should be selected with the same care. This should be indicated in the milestones.

Response: The team agrees with the concept. The language in the milestone addresses the selection of SSTs for establishing the SST retrieval sequence is covered in M-45-02. The selection of DSTs to transfer the SST waste to are being selected to assure both waste compatibility and to support future Waste Treatment Plant needs. There are limited spots to transfer SST waste to in the DST system as many of the DSTs are full. Some have already been the subject of extensive characterization and process testing for the Waste Treatment Plant; changing the composition of these tanks would require DOE to repeat this work. The focus of the M-45 milestones is on SST retrieval. DST selection is best covered under the treatment milestones. Minor changes have been made to milestone M-45-02 to note that DST waste and space must be considered in selecting the retrieval sequence.

2.

Commenter: M. L. Blazek, Oregon Office of Energy

Comment 2: The criteria for selecting SST pumping order appears to be based solely on their potential to contaminate the ground water. The SSTs also present significant immediate airborne release risks. These factors should also be considered in the evaluation of which SSTs to empty when.

Response: Agreed. The parties have developed a model that will focus our retrieval efforts toward the long-term goal of tank closure(s). However, tank C-104 was selected for an early retrieval based on its plutonium content. This tank contains the highest amount of Plutonium, (a concern for airborne contamination) of any of the SSTs. Milestone M-45-02 has been modified to state that all risk pathways will be considered in future tank sequencing documents.

3.

Commenter: M. L. Blazek, Oregon Office of Energy

Comment 3: The interim milestones associated with development of waste retrieval technology demonstration functions and requirements documents do not contain any requirement to submit acceptance-testing documents. We recommend this requirement be part of these milestones.

Response: The DOE and Ecology have considered this comment and have concluded that the language of the milestones does not need to be changed. Subsequent milestones ("completion of construction") require that acceptance testing be complete. The agencies will take this under advisement during the review of the Functions and Requirements (F&R) documents to determine if an F&R for explicitly requiring acceptance-testing documents is required.

4.

Commenter: M. L. Blazek, Oregon Office of Energy

Comment 4: The last sentence of the milestones associated with the development of waste retrieval technology demonstration functions and requirements documents is grammatically incorrect. Suggest it be re-worded to read, "This functions and requirements document will be submitted in a timely fashion so that....."

Response: Agreed. Text change made in the 4 locations that this occurs.

5.

Commenter: Robert D. Copp, Scientech Inc.

Comment : Scientech Inc. was pleased to receive your request for public comment on the "Single-Shell

Tank Waste Retrieval Actions, and Associated Leak Detection, Monitoring and Mitigation and Single-Shell Tank Farm Closure Activities". I will comply with the request as best we can. The request was addressed to Mr. Robert Knudson of Scientech. Mr. Knudson is no longer with Scientech and I request an address change so that Scientech can be assured of receiving future correspondence from your office. The new address should be:

Robert D. Copp, Director DOE Services
Scientech Inc.
440 West Broadway
Idaho Falls, Idaho 83402

Response: The updated address has been incorporated into the DOE and Ecology mailing list.

6.
Commenter: J. W. Hotarek, CH2M Hill

Comment 1: The RPP is on a Life-Cycle Baseline Management Execution Plan that includes cost and schedule. With this proposed change the effect on the existing cost and schedule baseline needs to be given.

Response: Most of the activities discussed (e.g. retrievals of S-102, S-112 and C-104) were already in the RPP baseline. These negotiations may have moved some of the planned activities, but all SSTs have always been scheduled to be retrieved within the RPP Life Cycle baseline. The near term cost and schedule impact of this work within the 2001-2006 timeframe has been provided to the DOE via an approved Baseline Change Request.

7.
Commenter: J. W. Hotarek, CH2M Hill

Comment 2: Identify the "Change Request" that will if approved, delete "out of date and non-enforceable schedules" and will add proposed modifications. This needs to include not only the TPA change request but also the DOE's Baseline Change Request.

Response: The TPA Change Request referred to is the document that was sent out for public review – e.g. Change Request M-45-00-01A. The DOE has processed a Baseline Change Request to incorporate this negotiated TPA change. The DOE detailed budget information is not a requirement for the TPA change request package. The DOE budget development cycle includes opportunity for public comment each year around the beginning of March.

8.
Commenter: J. W. Hotarek, CH2M Hill

Comment 3: Question deletion of " out of date and non - enforceable schedules ", should indicate the approved change and / or not being met.

Response: The text referred to is part of the fact sheet that went with the formal M-45-00-01A change request. The change request presents via red-line/strike-out the specific changes in the schedules.

9.
Commenter: J. W. Hotarek, CH2M Hill

Comment 4: Functions and Requirements Document, define what is embraced by the term.

Response: The text that accompanies the F&R milestones provides adequate overall definition. The DOE and Ecology staff have participated in joint workshops to assure clear understanding on both sides regarding what is expected in these documents.

10.

Commenter: J. W. Hotarek, CH2M Hill

Comment 5: Identify, construction projects with identification convention, if not assigned so note.

Response: It is assumed the commenter is referring to DOE internal project numbering. The C-104 work is covered under project W-523. The S-112 and S-102 work are expense-funded activities not under a specific project. This level of detail is not considered necessary for the TPA change package.

11.

Commenter: J. W. Hotarek, CH2M Hill

Comment 6: Change the 09/30/XX Milestone dates, as they are not realistic, falling at the end of the DOE's Fiscal Year.

Response: The reviewers could not find '9/30/XX' as part of performing a word search of the actual TPA M-45-00-01A change request. No change has been made as a result of this comment.

12.

Commenter: J. W. Hotarek, CH2M Hill

Comment 7: The New Strategy Key element " Assessment of options to create more tank space ", do not find a proposed milestone for a defined deliverable.

Response: The milestone that covers this new element is M-45-12-T01, "Submit an Options Report Documenting DOE Assessment of Actions that could be taken to increase available tanks space for SST waste retrieval".

13.

Commenter: J. W. Hotarek, CH2M Hill

Comment 8: The Work Breakdown Structure (WBS) to which the Key elements relate, needs to be given.

Response: It is not necessary or appropriate to put the internal DOE Work Breakdown structure into a TPA change document. For information, the proposed work is under the TW04, "Tank Retrieval" work breakdown structure today. The work breakdown structure is a DOE management tool, however, and the WBS may change in the future.

14.

Commenter: J. W. Hotarek, CH2M Hill

Comment 9: The Strategy " worst tank waste first " should find Widespread Acceptance.

Response: General statement of support, so no specific response required.

15.

Commenter: Patrick Sobotta, Nez Perce

Comment : The Nez Perce Tribe's Environmental Restoration and Waste Management Program (ERWM) supports the modification of Milestones M-045-00 as outlined in the public release dated August 31, 2000. ERWM favors and supports DOE's request to retrieve more waste from two single shell tanks (SSTs) than less waste from ten SSTs as previously required by the Tri-Party Agreement. It is our understanding that this modification will facilitate the removal of more curies at an earlier date from the SSTs for transfer to the double shell tanks.

The Nez Perce Tribe retains reserved treaty rights in the Mid-Columbia under the 1855 and 1863 treaties with the United States government. These rights have been recognized and affirmed in subsequent federal and state actions. These actions protect Nez Perce rights to utilize their usual and accustomed resources and resource areas in the Hanford Reach of the Columbia River and elsewhere. Accordingly, ERWM has support from the U.S. Department of Energy (DOE) to participate in and monitor relevant DOE activities.

We look forward to working with the Tri-Parties in a cooperative manner to work for completion of these milestones. Accordingly, we are willing to discuss these and other issues with the Tri-Parties.

Response: General statement of support, so no specific response required.

16.

Commenter: Lincoln C. Loehr, Mukilteo, WA., no affiliation noted

Comment: The costs will be quite high. Has anybody ever examined a semi-worst case scenario of all the underground tanks failing totally and all the contents being free to move however they will through the soil and rock, to the aquifer and to the Columbia River? I call this a semi-worst case scenario because I think any scenario where somehow a tank could build up pressure and result in a substantial atmospheric release would be a worst-case scenario. Anyhow, what would the other scenario (the total release to the ground of all the tanks) mean? Obviously nobody would want to drink the groundwater in the plume or in the path of the plume, but then, nobody does now anyway, and I don't think that would ever be a realistic cleanup objective anyway. Ok, so it would move towards the Columbia River, and obviously, the contamination in the groundwater would exceed human health drinking water standards. But not all of it would reach the Columbia River. Much would be bound up in the soil. At what rate would the contaminants be released to the Columbia River? Concentrations, or levels of radioactivity in the ground or in the groundwater plume are not relevant. Mass rate of release is relevant. Considerable dilution occurs with the Columbia River flow. The river has experienced very large continuous releases of radioactivity in the past, especially when many reactors were operating simultaneously each with once through coolant systems. I'm not saying that those past release rates were harmless, but we also know that we did not have substantial mass mortalities from them, and in fact, many researchers from Oregon and Washington used those known releases as tags on water and sediment and biota as it moved downstream and to the Pacific and the coast. My point is, the past releases provide us with a reference point in time. Would the scenario I described result in greater or lesser levels of radioactivity in the water, the sediments and the biota than the historical, known and well documented releases? Also, how much more, or how much less would the releases be? Sounds like a risk analysis to me, and I suspect that information exists to estimate this now. I acknowledge that many other concerns, would also exist, but the public is easily alarmed just by saying something exceeds a standard and it's moving towards the Columbia, and somewhere nobody is ever providing information relevant to what the actual rates of release, the dilution available, and predicted exposures would be. So, my comment is, why doesn't the agency provide this type of information. Perhaps the risks do not warrant the gigantic cleanup costs. If that is the case let me know. But maybe, that is something the agency would prefer to never allow to be considered since they can keep milking the federal purse forever on this. Well, I pay federal taxes as

well as state taxes, so I find I am uncomfortable with the costs regardless of which of my pockets foots the bill. What is cost effective? Where is the risk analysis to help me decide? Or, isn't that important?

Response: The analysis requested was addressed in the Tank Farm Environmental Impact Statement (DOE/EIS-0189, "Tank Waste Remediation System, Hanford Site, Richland, Washington Final Environmental Impact Statement", dated August 1996). The scenario you presented would be the 'no action alternative'. This document received public comment from April 12, 1996 through May 28, 1996. In addition, more detailed assessments have been performed since that time on a more limited scope. These documents are available in the DOE Public Reading Rooms which are identified under Section 5 of this document. The option selected after review of public comments was to retrieve and vitrify the SST and DST wastes.

17.

Commenter: Donald Evett, no affiliation noted

Comment : I read your proposed Hanford's Tri-Party Agreement "Single-Shell Tanks Waste Retrieval Actions, and Associated Leak Detection, Monitoring and Mitigation and Single-Shell Tank Farm Closure Activities."

The proposed new strategy and the key elements of the proposed milestone are excellent goals and it is hoped that your new strategy goals can be met. It is gratifying to see such a proposed strategy and it is hoped that annual budgets will support such goals. This will certainly be a remarkable milestone for DOE.

Response: General statement of support, so no specific response required.

18.

Commenter: James Lee, no affiliation noted

Comment : While searching the Internet I came across the following. Do you know of this product? I would think that this would make good sense for the US government to look into. <http://www.ens-news.com/ens/sep2000/2000L-09-18-02.html>. It apparently has worked well at Chernobyl. Why not try it here? Are you aware of this and has it been approved for use here in the US? I've done additional research and found that this product may be exactly what is needed here in the US. Please view the company's website also. <http://www.eurotechltd.com/>

Text of Link follows:

New Polymer Coating Immobilizes Chernobyl Radioactive Waste WASHINGTON, DC, September 18, 2000 (ENS) - A newly developed white silicon polymer coating known as EKOR can completely encapsulate nuclear waste and prevent radioactive contaminants from dusting or seeping into the environment. The substance which is now being demonstrated at the damaged Chernobyl nuclear reactor could solve problems of nuclear waste management anywhere in the world, its developers say. In March, the EKOR coating was applied in a successful demonstration that contained radiation from the destroyed nuclear reactor at Chernobyl near Kiev, Ukraine. Robots applied the polymer to cover the largest fuel containing mass under the failed Reactor 4 at Chernobyl, the most radioactive spot on the planet. EKOR coating covers a pile of a molten nuclear fuel located under the Chernobyl reactor. It was dusting and leaching before it was covered by EKOR. This photo was taken after about four months after the coverage and demonstrates no changes in EKOR. (Photos courtesy Eurotech)

Another, more extensive application, is planned for October to develop and fine tune the methods and equipment for applying EKOR coatings to nuclear waste. When Reactor 4 was destroyed by an explosion and fire in April 1986, molten nuclear fuel collected beneath the ruined reactor where it has

been emitting deadly radiation ever since. Many substances have been applied in attempts to contain radiation from the fuel masses and surrounding radioactive dust at Chernobyl, but all have disintegrated within three or four months from the effects of the radiation. The ruined reactor and the nuclear fuel masses on the ground floor below are not really protected by the concrete structure that now partially covers the mess. Rainwater enters the building and carries the radioactivity into the soil and groundwater. Birds fly through and become contaminated.

International donors have collected millions of dollars to build a new concrete structure over the reactor, but construction has not yet begun. EKOR was certified for use by the Ukrainian government in August after an initial application of the composite at Reactor 4 proved that EKOR is radiation resistant, does not degrade even after long term exposure to radiation, and can withstand extreme physical, chemical and biological assaults on its structural integrity. The substance was developed by Russian scientists at the Kurchatov Institute in Moscow. Some of these scientists went to Chernobyl shortly after the explosion and realized that a way of containing the deadly radiation must be found. The Institute covered the costs of research and development of the polymer.

Kurchatov Institute scientists also developed advanced robots to apply the EKOR coating in the dangerous working conditions under the failed Reactor 4 where humans would suffer the lethal effects of the radiation. Don Hahnfeldt is president of Eurotech. Once created in the laboratory, the rights to produce and market EKOR were acquired by Eurotech, a publicly traded international technology holding and marketing company based in Washington, DC. Eurotech provided the funds to take the polymer from the laboratory stage to testing and demonstration in the field. Eurotech president Don Hahnfeldt estimates the total development cost of EKOR to date is approximately \$3 million. Eurotech is currently working with NuSil Technology in Santa Barbara, California to test and prepare EKOR for commercial production in North America where hundreds of nuclear waste sites are emitting radiation. EKOR is non-toxic, highly fire and heat resistant and can be applied wherever the radioactive material is located, on all surfaces, wet, dry, clean or dirty, according to Peter Gulko, a major shareholder and former director and president of Eurotech. Originally from Kiev himself, Gulko provides liaison between Eurotech and its affiliates in Russia and Ukraine. To prevent radioactive waste and contaminants from spreading, the ideal encapsulating material must not degrade or decay over centuries of prolonged exposure to radiation and environmental corrosion. Closeup of EKOR coating in Chernobyl reactor 4. Once applied, the material must form an impervious barrier to water and prevent contaminated materials from leaching into the environment. The substance must be nonflammable and non-toxic, causing no harmful effects to the environment. After exposure to radiation, the material must be disposable as environmentally safe non-radioactive waste if necessary. Gulko says EKOR meets all these criteria.

Recent fires near the Hanford Nuclear Reservation in Washington State, the Los Alamos National Laboratory in New Mexico and at the Idaho National Engineering and Environmental Laboratory illustrate the potential for future nuclear accidents.

At power plants across the United States and in other countries, thousands of tons of spent nuclear fuel are waiting for safe disposal. Radioactive wastes left from Cold War plutonium production for nuclear weapons at Department of Energy facilities across the United States, at the Mayak nuclear complex in Russia, and elsewhere around the world. All of these materials are emitting radiation.

An underground scaling machine removes loose rock from walls and ceilings in the WIPP underground to create a storage area for transuranic waste. (Photo courtesy WIPP) only one facility in the world, the Waste Isolation Pilot Plant (WIPP) in the state of New Mexico, USA, is an operating geological repository designed for permanent disposal of long-lived radioactive wastes. It accepts transuranic, but not high-level nuclear wastes for storage in salt caverns half a mile below the surface of the Earth.

Scientific evaluation of Yucca Mountain, Nevada for the permanent disposal of high-level nuclear waste has found that even in this arid environment, water might come in contact with the containers in which the waste would be held, eventually eroding the containers and allowing radioactivity to escape. The greatest problem in nuclear waste management is that many of the facilities designed to store and dispose of these wastes have failed to prevent the leakage into the environment, leaving the groundwater, surface water, soil and air at risk of contamination. If the EKOR coating continues to perform as it has in the first demonstrations, some of the most dangerous nuclear waste in the world might be more manageable.

Response: The product mentioned has potential application for facility decommissioning, and may be of value to consider in tank closure activities (e.g. after the bulk of the wastes have been retrieved from the SSTs). The DOE and Ecology staff do believe that the bulk of the wastes will first need to be retrieved from the tanks prior to this method being effective. The web location and information provided has been provided to the staff supporting tank closure evaluations.

4. Actions Taken

As a result of the comments received, the Tri-Party Agreement Change Control Form (Change Request) has been modified and approved by the three agencies. Modifications prior to final approval were as follows:

- Modified language of M-45-02, 'Submit Annual Updates to SST Retrieval Sequence Documents' to address both the airborne risk pathway and potential DST waste constraints in SST retrieval as requested in comment #2.
- Editorial comments from comment #4 have been incorporated into the Functions and Requirements milestones.

5. Availability of Information

This summary as well as the parties approved M-45-00-01A Change Request are available for review at the three Tri-Party Agreement Information Repositories (Seattle, Spokane, and Portland) and at DOE's Public Reading Room in Richland.

Seattle

University of Washington
Suzzallo Library
Government Publications Room
Mail Stop FM-25
Seattle, WA 98195
(206) 543-4664
Attention: Eleanor Chase

Spokane

Gonzaga University
Foley Center
E. 502 Boone
Spokane, WA 99258
(509) 328-4220 extension 3125
Attention: Lewis Miller

Portland

Portland State University
Bradford Price Millar Library
SW Harrison and Park
P.O. Box 1151
Portland, OR 97207
(503) 725-3690
Attention: Michael Bowman

Richland

Washington State University/
Tri-Cities
DOE Public Reading Room
2770 University Drive
Room 101L
Richland, WA 99352
(509) 372-7443
Attention: Terri Traub

A copy of the final Tri-Party Agreement change and this comments and responses document may also be obtained by contacting the parties Hanford Cleanup Line at 800-321-2008. More information about the Tri-Party Agreement and Hanford can be found on the Hanford Web site (<http://www.hanford.gov>).