APPENDIX 1 RCTD WBS and WORK PACKAGE STRUCTURE **5/30/00**

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A. Activity/Line Item Raschig Ring Removal Activity	**FTE**	**SKILL**	**HOURS**	**BOE COST**		**WORK PACKAGE-DESCRIPTIONS** **The following line items provide the process flow, basis of estimate and the work steps for the Raschig Ring Removal/Cerium decontamination activity**
	1 1 1	PM-ENG PM-ENG ENG	.75 FT .5 FT 1 Ft			This is Kohler and Martella This is one new engineer This time is budgeted for all three activities **A) Raschig Ring/Cerium decon, B) Cerium Decon Cold Mockup, C) MTC IWCPs`**
1. Std Work Package	2	Planner A5H P070	360			This process flow address is designed for room 3559 One standard work package is built covering 1) tank fogging, 2) Raschig ring removal, and 3) cerium decontamination One corresponding EDP is developed from each room containing tanks
1.1 Nuclear Screen	1	NS ENG	40			
1.2 RWP/ALARA	1	RAD ENG RCT	40			
1.3 Crit Limits	1	Crit ENG	40			
1.4 JHA/JHIT	1 2 1 3 1	FOR PM-ENG PS MTC IH. P080	20			MTC Pipe fitter Sheet metal Electrician I
1.5 Develop Endpoints	1	PM ENG	INC			Included in Activity A
1.5.1 MSDS						
1.6 Room Walkdown						Included in 1.4 JHA/JHIT
1.6.1 Miscellaneous IWCP		A5H		$25k		Based on walk downs, in certain room specific things may need to be fixed
1.7 Precautions Limitations			INC			Included in **Item 1** • No reaching into tank w/o tools or prior approval from Forman
1.8 Pre-Scan (NDA)	2	NDA	27 hours-			• 2 tanks per day, 3 days for 6 tanks If pre-scan is less than 200g no gram estimation is required of tank and sludge. If scan exceeds 200g then each individual of container and rings must be gram estimated

A. Raschig Ring Activity Continued	**FTE**	**SKILL**	**HOURS**	**BOE COST**		**WORK PACKAGE NARRATIVE-**
1.9 Develop/Procure Commodities		A5C		$100k		Detailed list covering fogging Raschig Rings and Cerium decon provided in Appendix 2 Established for 6 tanks
1.10 WGI's For Waste And Sludge	2	ESH&Q	80			Holbrook
2. Engineering Design Package	1	DES-ENG E130	140			• 20 hours per tank • 40 hours per tank cluster • 40 hours per room • There are two tank clusters in room 3559 • There is one EDP **per room** with individual portions covering fogging, Raschig ring removal, and cerium decontamination
2.1 Raschig Ring Removal EDP Component						This portion of he EDP includes: • Valve line-up • Residual draining • Inlet pipe isolation • Post valve lineup
2.2 Fogging EDP Component						This portion of the EDP includes • Valve lineup • Ventilation adjustment • Install fogging connections • Post valve lineup
2.3 Cerium Decon EDP Component						This portion of the EDP includes: • CWTS valve lineup • Cerium volume and concentration amounts per tank • Kill cerium • Post tank configuration • Cut exhaust lines • Install cover • Isolate drain lines

A. Raschig Ring Activity Continued	**FTE**	**SKILL**	**HOURS**	**BOE COST**		**WORK PACKAGE NARRATIVE-**
3. Work Steps						This section provides the detailed work steps to be included in the STD work package
3.1 Fogging Work Steps						
3.1.1 Fog the Tank		A5H				• Develop ET Contract Work out scope, performance and budget. Develop contract • Deliver fogging commodities
	1 1 3	FOR RCT PS	30			• Perform pre-evolution and 3.12 • Perform fogging valve lineup • Fab fog connections
	2	PF CO80	18 h /tank			• Perform residual drain • Hydrogen Purge
						• Install connect fog equipment
						• Post fogging steps • Remove the fog equipment
						• Perform post valve lineup IAW EDP/Fogging
3.2 Raschig Ring Removal Work steps	1 1 6	FOR RCT PRSPC	50 per room			• Perform pre-evolution and 3.12
3.2.1 Remove Raschig Rings	2	Co80	18/tank			• Deliver commodities • Install Permacon • Isolate inlet valves IAW EDP/Raschig Rings • Install scaffolding • Erect containment pen and air movers • Install ring retainer • Remove port and level sensor
• **Pre Req**	2	CO20	2/tank			• Take DAC reading • Make sure commodities lists addresses air movers • Adjust port air flow • Adjust ventilation • Stage drums
						•

A. Raschig Ring Activity Continued	**FTE**	**SKILL**	**HOURS**	**BOE COST**		**WORK PACKAGE NARRATIVE-**
• **Remove Rings**	1 1 6	FOR RCT PRSPC	240			• 40 hours per tank • Position container and bags • Add kitty litter (oil dry)
						• Remove rings using tools and place in 5 liter poly bottles • X Tape lids
						• Place poly containers in bags • Bag out poly containers
						• Use two bag process • Gram estimate (if pre-scan of tank is greater than 200 grams
						• Place containers in drums in a three X two array (probably 30 gallons of rings in a 55 gallon drum)
						• Disposition drum (drum gets sealed and transferred to nuclear operations, IH&P • IH&P to count drum and stage for WIPP • Position new drum
3.2.2 Remove Sludge						• 1-4 sludge bottles per tank • Stage four liter wide mouth bottles • Scoop sludge into four liter bottles (Note fill only one four liter poly bottle at a time; next bottle cannot be filled until previous filled bottle is removed IAW crit limits.
• One sample per tank • Full 559 ID RCRA Standard		Sludge Tie to CWTS Calcinate if >10% Pu w/0 Waste if < 10% Pu w/0				• Six hot samples, one for each tank if >10% • Gram estimate sludge • Count/Cal Poly bottles of sludge • Sample sludge for tank characterization IAW RCRA. Note these tanks contain nitric acid and the towels are combustible. The towels will have to be rinsed in another glove box, dried and bagged out as line generated waste • Disposition towels
						• Swab out bottom of tank using tools • Bag out sludge

A. Raschig Ring Activity Continued	**FTE**	**SKILL**	**HOURS**	**BOE COST**		**WORK PACKAGE NARRATIVE-**
3.2.3 Post Tank Configuration	1 3 1 2	FOR PRSPC RCT PF CO80	18 per tank			• Remove ring retainer • Re-install port or new port fabed
						• Remove scaffolding • Remove pen
						• Perform post valve lineup
3.2.4 Go to Next Tank						•
3.3 Cerium Decon Work Steps	1 4 1	FOR PRSPC RCT	60 per tank			•
3.3.1 Decon the Tank				Liquid Tie to CWTS		• Perform Pre-ev and 3.12 • Perform CWTS lineup Install scaffolding • Remove old port 2-Co80 12 hrs/tank
						• Install new port • Install delivery system
						• Kill cerium and chrome (using ferrous sulfate • Drain cerium nitrate to CWTS
						• Rinse tank with (steam or water, see cold mockup leg)
3.3.1.1 Decon tank 2nd time						
3.3.2 SCO GO NO GO						• Smear tank • SCO Decision • Rework if necessary 2-CO-808 hr/tank bottom smear incl in 3.3.1
3.3.3 Post tank Configuration	1 4 1	FOR PRSPC RCT	9 h tank			• Remove scaffolding • Remove delivery system •
	2 1 2	PS RCT PF	9 h tank			• Isolate exhaust lines and drain lines • Install port covers 2 days
						•

B. Activity/Line Item Cerium Decon Cold Mockup	FTE 1 1	SKILL FOR PRSPC	HOURS 320	BOE COST Month		WORK PACKAGE NARRATIVE- The following line items provide the process flow, basis of estimate and the work steps for the designing, building, operating the cerium decon cold mockup facility. This section also includes developing the cerium decon tank protocols as documented in the final teat report
1. Develop the IWCP	1	MTC Planner	40			
1.1 Nuclear Screen						
1.2 RWP/ALARA						
1.3 Crit Limits						
1.4 JHA/JHIT						
1.5 Develop Endpoints						• Final test report
1.5.1 MSDS						
1.6 Room Walkdown						
1.6.1 Miscellaneous IWCP						• Based on walk downs, certain room specific things may need to be fixed
1.7 Precautions Limitations						
1.8 Procure Commodities		A5C		50K		Cerium for first six tanks plus

B. Activity/Line Item Cerium Decon Cold Mockup Continued	FTE	SKILL	HOURS	BOE COST		WORK PACKAGE NARRATIVE-
2. EDP Design		A5H	$50k			Design delivery system and rinsing system
3. Develop Ops Order						This OPS order is used to operate the cold mockup
4. Develop IWCPs for Cold Mockup Components						
4.1 Spray header	1	Planner	120			
4.2 Port						
4.3 Delivery System						
4.4 FAB Spray	2	MTC	80			
4.5 FAB Port						
4.6 FAB Delivery System						
5. Run the test			INC			• Inc Activity B • Corrosion rates • Dilution and concentration rates • Fixative if necessary • Treating of spent liquids
5.1 Develop the tank protocols						
5.2 Develop the final test report						

C. Activity/Line Item Maintenance IWCPS	FTE	SKILL	HOURS	BOE COST		WORK PACKAGE NARRATIVE- The following IWCPs will design and build the tools and connections that are required to support Raschig Ring removal and Cerium Decon The IWCPs for the cold mock up are incorporated into Activity B, Cerium Decon Cold Mockup
1. Raschig rings						
1.1 IWCP Design tools	1 1	DES ENG	80			
1.2 IWCP Design Containment Pen						
1.3 IWCP Design Ring Retainer						
1.4 IWCP Replacement Port						
1.5 Fab Tools	2	MTC	80			First six tanks
1.6 Fab containment pen						
1.7 Fab Ring Retainer						
1.8 Fab replacement Port						
2. Fogging						
2.1 IWCP Design fog connection	2	MTC	40			
2.2 Fab connection						
3. Cerium Decon						
3.1 Design Fab						
3.2 Fab Connection						

Appendix 2

Activity and Work Package Breakdown Structure 5/15/00