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TRU Solid Waste Operations Area G Closure Planning August 2011

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Defense Board overview



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TRU Solid Waste Operations Area G Closure Planning Los Alamos National Laboratory











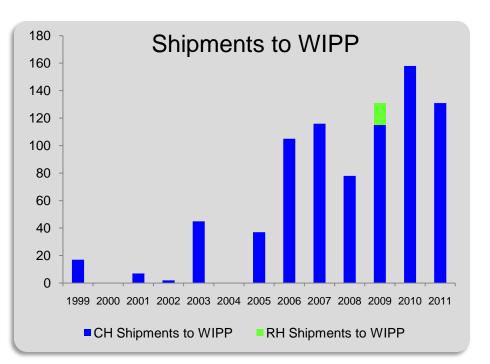
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- History (1999-present)
- Over 121,000 PE Ci
 - 53,000 legacy
 - 68,000 new gen & OSRP
- Over 17,000 containers
 - 12,000 legacy
 - 5,000 new gen & OSRP



Record shipments in past 2 years and on track for a new record in 2011

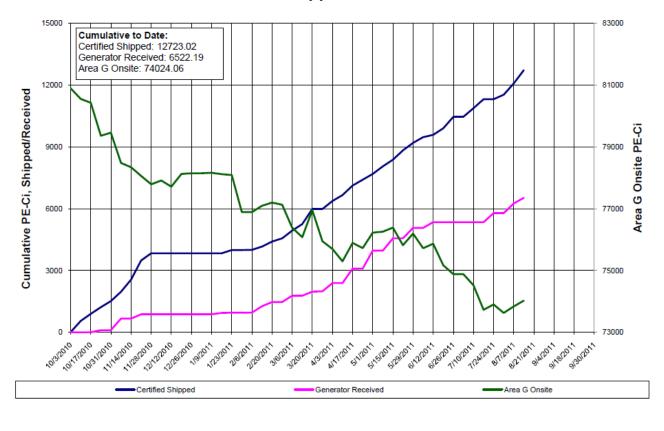


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FY11 Risk Reduction



MAR Shipped/Received

NOTE: Shipped/Received/Onsite includes 10% OSR PE-Ci where container was/is part of the Area G inventory.

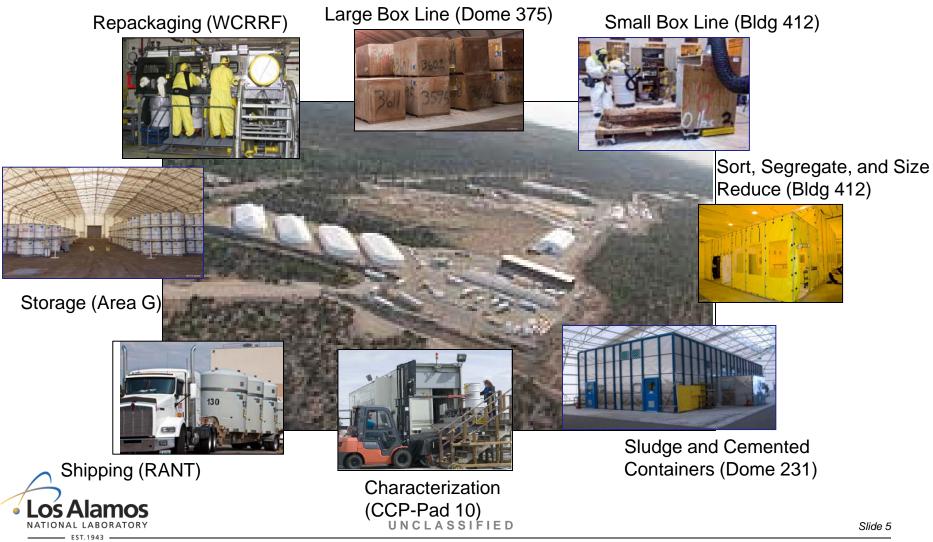
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Repackaging and Sort, Segregate and Size Reduction Capabilities

Capability	Pre-2006	Current	Final
WCRRF	< 56 PE Ci	300 PE Ci ECW	800 PE Ci ECW Implement in FY 11
Dome 231	< 0.52 PE Ci	2.5 PE Ci ECW	No Change
Bldg 412 Drums	< 0.52 PE Ci	2.5 PE Ci ECW	No Change
Bldg 412 Boxes	< 0.52 PE Ci	2.5 PE Ci ECW	2.5 PE Ci ECW Readiness in FY 11
Dome 375 Boxes	TRU Storage	Empty Drum Storage	2.5 PE Ci ECW Readiness in FY 12
Drum Venting	Minimal controls	Not Authorized	BMD and >30' Standoff Readiness in FY 12

Equivalent Combustible Waste (ECW)

Implementation Verification Review (IVR)

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Blast Mitigating Device (BMD)

Contractor Readiness Assessment (CRA)

Federal Readiness Assessment (FRA)

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Characterization Capabilities

Capability	Pre-2006	Current	Final
RTR-1	Operational	Refurbish Complete	Readiness in FY12
RTR-2	Operational	Operational	No Change
High Energy RTR	N/A	Pre-MSA RED Team Review	90 PE Ci ECW Readiness in FY 11
HENC-1	Operational	Operational Improved Uncertainty	No Change
HENC-2	Operational	Operational Improved Uncertainty	No Change
Super HENC	N/A	Operational	No Change
Temperature Equilibrium Units	Dome 33	Dome 33 and Pad 10	No Change



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Shipping Capabilities

Capability	Pre-2006	Current	Final
RANT	233 PE Ci	1840 PE Ci	No Change
RANT MLU	25 PE Ci Waste Stream Limited	1840 PE Ci	1840 PE Ci Implement in FY 12
Area G MLU	N/A	1100 PE Ci Pending Approval	1100 PE Ci Implement in FY 12

Mobile Loading Unit (MLU)

RANT crane availability > 90% in FY11 due to enhanced PM program



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Above Grade Inventory (as of 6/19/11)

Description Volume (m³) MAR (PE-Ci) Total Containers Legacy Containers Sludge Drums 122 168 468 436 Debris Drums 611 26,326 2,668 2,047 Cemented Monoliths 207 14,509 877 538 Cemented Cans 488 25,627 1,927 1,927 Salt Drums 14 741 66 15 10-100 MLLW 970 147 2,840 2,434 SWBs 516 4,886 272 163 FRPs/Crates/Metal Boxes 2,198 3,000 260 234 OSRP 46 4,393 221 0 Other Containers 10 30 36 2	Legacy Containers	New Gen Containers	Require Venting									
Sludge Drums	122	168	468	436	32	152						
Debris Drums	611	26,326	2,668	2,047	621	165						
Cemented Monoliths	207	14,509	877	538	339	14						
Cemented Cans	488	25,627	1,927	1,927	0	52						
Salt Drums	14	741	66	15	51	0						
10-100 MLLW	970	147	2,840	2,434	406	1						
SWBs	516	4,886	272	163	109	0						
	2,198	3,000	260	234	26	0						
Bolas Grande	29	62	31	31	0	0						
OSRP	46	4,393	221	0	221	0						
Other Containers	10	30	36	2	34	23						
TOTAL	5,211	79,889	9,666	7,827	7 1,839 40							



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Below Grade Inventory (as of 6/19/11)

Pit 93,88Corrugated Metal Pipes (CMPs)158 20' L33 Lined Shafts32 S 1 shHot Cell Liners5 shTRU with Tritium Packages4 Tri Tritium	Description	Legacy Containers	Volume (m³)	MAR (PE-Ci)
Trenches A-D	720 Drums at 30 Gallons Each	720	335	93,870
Pit 9	3,881 Drums and 197 Boxes	4078	1,560	6,019
- ·	158 CMPs at 30" in Diameter by 20' Long	158	442	10,755
33 Lined Shafts	32 Shafts w/ RH hot cell debris; 1 shaft contains reactor vessel	33	3.4	97
Hot Cell Liners	5 shafts with RH hot cell lines	5	51	0.5
TRU with Tritium Packages	4 Tritium Torpedoes and 1 Tritium Tank	5	6.7	8
RH Canisters	1 Canister	1	1.0	1.5
TOTAL		5000	2,400	110,751



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Solution Package Approach

- 15 waste categories
- Approximately 60 waste solution packages
- Focus on container type
- Aligns processing and characterization

AG Cement - Cans	Container Issues		
	Multiple Issues		
	NDA-Uncertainty		
	No Issues		
	Overweight		
	Unvented		
AG Cement - Mono	CIN 01 Lead-Lined Monoliths		
	CIN 02		
	CIN Monoliths		
	Container Issues		
	Overweight	AG Solids	>200 mR/Hr
	Unvented		Container Issues
AG Debris Boxes	Corrugated Metal Boxes		H-Gas Issues
AG DEDITS BOXES	Haz Cat 3 Boxes 412 $>$ 3.4 to $<$ 8.2 m3		Misc Issues
	Haz Cat 3 Boxes $412 < 3.4 \text{ to} < 8.2 \text{ m}$		Multiple Issues
	Haz Cat 3 Boxes $412 < 3.4 \text{ m}^3$ Haz Cat 3 Boxes $412 > 8.2 \text{ m}^3$		NDA-Rad
			No Issues
	Large HC3 Boxes - Remed in Place		PID in Matrix
	Metal Boxes > 4x4x6		Unvented
	MLLW Boxes < 8.2 m3	BG Cement - Cans	Process Below Grade Containers
	No Issues	BG Cement - Mono	Process Below Grade Containers
	Rad Boxes 412 > 3.4 to < 8.2 m3	BG Cement - Mono	Process below Grade Containers
	Rad Boxes 412 < 3.4 m3	BG CMPs	Process Below Grade Containers
	Rad Boxes 412 > 8.2 m3		
AG Debris Drums	>200 mR/Hr	BG Debris Boxes	BG Haz Cat 3 Boxes 412 < 8.2 m3
	Container Issues		
	Misc Issues		BG MLLW/LLW Boxes BG TRU Boxes
	Multiple Issues	BG Debris Drums	BG MLLW/LLW Drums
	NDA-Rad	BG DEDIIS DIUIIIS	BG TRU Drums
	NDA-Uncertainty	BG HC3 Canisters	Process Below Grade Containers
	No Issues	DO INCS Callisters	Process below Grade Containers
	Overweight	BG Hot Cell Liners	Process Below Grade Containers
	PID in Matrix		
	Tritium	BG RH 17	Process Below Grade Containers
	Unvented	DC Calida	Process Bolow Crode Container-
	WIPP WAC Issues	BG Solids	Process Below Grade Containers
		BG Trenches	Process Below Grade Containers



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Solution Package Approach

- Priorities established between CBFO, LASO, CCP, and LANL as
 - 1. Keep remediation lines processing
 - 2. Feed highest MAR first
- Integrated LANL and CCP schedule
- Key metrics shifting from number of shipments to cubic meters and PE curies



iy ID	Activity Name	Firish	Original	Start	Parent Leg. Cont. D	Leg. aughters	Volume	Leg Pe-Ci	Cont. D	NG leughters	Volume	NG Pe-CI	01 F0	2011 EQ3	FOA	EQ1 E	FY2012	2 50	600	1 FQ2	2013	507	FQ1 F	FY201	a les	14 EO	P1	22 FQ3	I FOT	E01	FC
perations		Dec-08-15	1380.9d	May-24-1	8987.00	18158.00	5188.60	155429.22	1834.00	1740.00		10865.32	ui ru	rus	rus	PQ1 P		5 10		i ruz	Pus	rue	No.	102 11		-	1 100	2 Pus	100	-	10
WCRRF		Nov-08-14	872.04	Apr-25-11	3910.00	0.00	1042.77	102371.47	198.00	0.00	35.27	1058.41		-	-	-	_	+	+	-	<u>+</u> -		-	<u>+</u>	<u> </u>	÷	Nov-08				
Stabilization	& Disposition Operations Project Drums (TRU)	Nov-06-14	872.04	Apr-25-11	3910.00	0.00	1042.77	102371.47	168.00	0.00	35.27	1058.41	1	-	-	-	-	-	-	-	+		-	-	-	-	Nev-08	3-14	1		į.
AG-Debris I	Drums	Jun-19-12	286.0d	Apr-25-11	1181.00	0.00	297.26	13912.78	168.00	0.00	35.27	1058.41		-		-	-	Jun	18 12											1	1
A18950	Process SP >200mR/hr (#1) @ WCRRF (1 crew)	Sep 30-11		Apr-25-11*	359.00		81.17	4837.08							_		SP>20														1
A18930	Process SP >200 mR/hr (#1) @ WCRRF (2 crews)	Nov-14-11		Oct-03-11	145.00		32.84	1985.05	37.00		7.70	420.74		1		Proc						crews)						-	Τ	ſ	T
A10860	Process SP NDA-RAD (#15) @ WCRRF	Dec-15-11		Nov-15-11	118.00		24.54	2808.85	12.00		2.50	194.90		1		E P	Incess 81													1	1
A10740	Process SP Container Issues (#13) @ WCRRF	Mar-02-12		Dec-18-11	222.00		60.25	2539.47	85.00		17.68	359.89	1		!!	t de la composición de la comp						e wo							1		1
A1300	Process SP Unvented Debris (#3) @ WCRRF	May-02-12	43.0d	Mar-05-12	204.00		65.13	1374.94					i	1 1	i i	i						F3) @ 1	VCRR	i	1	i	i	i	i	i i	i
A1320	Process SP Overweight (#12)	May-24-12		May-03-12	81.00		20.48	176.22	18.00		3.85	14.95								Dverweig			. 1							1	1
A10820	Process SP PID in Mattix (#16) @ WCRRF	May-30-12		May-25-12	14.00		3.03	93.25	1.00		0.20	2.26								PID in M			KORRP					-	T		1
A10980	Process SP WPP WAC-Chem (#17) @ WCRRF	Jun-01-12		May-31-12	4.00		0.83	8.11	3.00		0.62	29.24	i	1	i i	1							a wea	(RF	1	1	1	1	i .	i i	i
A10800	Process SP NDA-Unc (#14) @ WCRRF	Jun-06-12		Jun-04-12	8.00		2.23	31.60	4.00		0.95	6.14										e wo	RF								1
A0240	Process SP Misc. Debris Drums (#2)	Jun-08-12	2.0d	Jun-07-12	4.00		0.95	14.93	4.00		0.83	0.96								Mec. D			0							1	1
A10480	Process SP Tritium (#19) @ WCRRF	Jun-12-12		Jun-11-12	12.00		3.08	37.72					1	1	i i	1	1	Proc	ees SP	Titlum	(# 19) (WCR	æ [1	1	1	1	1	1	i i	i
A10360	Process SP Multiple Issues (#20) @ WCRRF	Jun-19-12	1.04	Jun-19-12	10.00		2.75	27.58	4.00		0.95	27.33			Γ Τ			I Pro	ees SF	P Multipi	ecissue:	e (#20) e	WCRR	F				-	T		T
BG-Debris	Drums in Pit-9	Nov-06-14	322.04	JJ-18-13	2001.00	0.00	410.31	4064.91	0.00	0.00	0.00	0.00										-	-	-	-	÷-	Nev-08	ð-18			
A13810	Process SP Retrieve and Vent BG Debris (#39)	Nov-06-14	322.06	34-18-13	2081.00		410.31	4064.91					1	1 1	i i	1	1	1	1		i .		<u> </u>	-	-	÷	Pipose	ss SP Re	rijeve ar	d Ver	×
BG-Trenche	is A-D Debris Drums	Jul-12-13	261.0d	Jan-20-12	668.00	0.00	395.20	84393.80	0.00	0.00	0.00	0.00						+	+	+	÷	7 34	2-13								1
A13950	Process SP Retrieve and Vent BG Trenches (#40)	Jul-12-13	261.0d	Jun-20-12	668.00		395.20	84393.80										÷	-	-	<u> </u>	Pro	ess SP F					(#40)		1	1
ermacon li	n Dome 231	Od-31-14	779.0d	Aug-30-11	3758.00	0.00	913.91	35682.78	338.00	0.00	72.48	6665.50			-												06-31	-14	+		1
Stabilization	& Disposition Operations Project Drums (TRU)	Oct-31-14	779.0d	Aug-30-11	3758.00	0.00	913.91	35682.78	338.00	0.00	72.48	6065.50			. +	-	+	+	+	+	÷	-	-+-	÷	+	÷	06-31-	-14		1	1
AG-CIN Mor	1	Feb-21-12	112.0d	Aug-30-11	551.00	0.00	138.80	7758.47	310.00	0.00	65.48	6590.90			-		V Reb 3	1-12												1	1
A1610	Process SP CIN02 Container Issues (#5) (AG Cement-Mono)	Sep-20-11	15.0d	Aug-30-11	142.00		42.50	494.59	51.00		11.63	42:27			•	Process	SP ČINO	2 Conte	iner les	uuu (#5)	AG C	ement-t	(ono)							1	1
A1630	Process SP CIN Monoliths (#8)	Sep-28-11	4.05	Sep-21-11	5.00		1.04	4.69	44.00		9.15	507.53				Process	SP CIN	Menoilt	(PC)											1	
A1860	Process CIN01 Lead Monoliths (#7)	Dec-20-11	43.0d	Od-18-11	333.00		72.40	6703.60	215.00		44.70	6041.10		1	Ft	i P	TOOMAS C	NOT LA	ed Mon	nolthe (#	有	t1	····-						+	1	1
A12960	Process SP Overweight CIN Mon (#35)	Dec-21-11	1.00	Dec-21-11	1.00		0.90	34.60						1		d P	100848	Piowen	mone C	3 Mon	6835									1	1
A12830	Process SP Unvented CIN Mon (#34)	Feb-17-12	10.04	Feb-08-12	70.00		22.58	520.99					1				Proce						. !								1
A17260	Process SP WPP WAC CIN MON (#4)	Feb-21-12	0.04	Feb-21-12	0.00		0.00	0.00					i	i i	i i	i	I Proce	IN SP V	N 99N	INC CIN	MON	¥4) İ	. i	i	i	i	i	i	i	í	i
AG-Solids		Feb-08-14	103.04	Aug-23-13	481.00	0.00	143.50	660.40	28.00	0.00	7.00	74.60		1					1			-	_ +	7 Feb (38-14					1	1
A12390	Process SP Container Solids (#26) @ 231	Oct-09-13	33.0d	Aug-23-13	140.00		40.30	441.00	27.00		6.80	59.50			+						+	- 2			ontener				+		1
A11700	Process SP Unvented Solids (#22) @ 231	Dec-17-13	45.0d	Oct-10-13	228.00		73.40	198.10					i	1 1	i i	1	i	i	i	1	i i	i i	i 💶 İ P	Process !	SP Unve	antid B	iolida (#2	22 0 25	31	í –	i
A11760	Process SP >200 mR/hr Solids (#24) @ 231	Dec-18-13	1.06	Dec-18-13	1.00		0.20	1.20	1.00		0.20	15.10											. I P	Tocess '	SP 200	3 mR/hr	Solda ((124) @	231	1	1
A12570	Process SP PID in Matrix Solids (#20) @ 231	Jan-17-14	14.0d	Dec-19-13	71.00		16.70	13.60											1		1		. 📥	Proper	IN SP PF	DiaMe	atrix Soli	6ds (#29)	0 231	1	1
A12230	Process SP Multiple Issues Solids (#33) @ 231	Jan-30-14	8.04	Jan-21-14	38.00		12.20	6.00					1					1	1		1	1 1	. Tr	8 Prior	an 🛊 P M	Autorio	Issues 7	Solds (#	1002	ân 👘	1
A12010	Process SP H-Gas Solids (#31) @ 231	Jan-31-14	1.06	Jan-31-14	2.00		0.50	0.40						1	F†						÷	+		I Proor	as SP H	Can S	Jolida (#	S1 Q 2	te	·	1
A11790	Process SP High NDA-RAD Solids (#25) @ 231	Feb-03-14	1.04	Feb-03-14	1.00		0.20	0.10						1 1		1			1		1		. 1	Piper	m PPP	100 ND	CANAL	Ballas (8	400:	lan 🛛	
AG-Cement	ed Drums	Aug-22-13	375.04	Feb-21-12	1909.00	0.00	483.14	25424.98	0.00	0.00	0.00	0.00					+	+	+	+	—	-	ug-22-13								1
A13110	Process SP CIN01 Container Issues (#36)	Jun-10-13	323.0d	Feb-21-12	1654.00		401.31	21555.80									÷	-	-	-	÷	Ртосни	SP ON	401 Con	tainer Isr	auna (F	1981				1
A13230	Process SP Unvented CIN Cans (#37)	Aug-19-13	49.0d	Jun-11-13	250.00		80.43	3783.28					1	1	1			1	1	1	1.		TOORSS SI	P Under	nted CIN	Com ((#31)	1	1	1	1
A13680	Process CIN01 SP CIN Cars Overweight (#38)	Aug-20-13	1.06	Aug-20-13	3.00		1.00	80.00				ŀ			F†						+7	11	vocese C	INOT SP	CINC	ans Own	erweight	£ (#38)	+	(1
A12450	Process SP WPP-WAC (Cin Cans) (#27)	Aug-21-13	0.04	Aug-21-13	0.00		0.00	0.00											1		1	1.6	Vocese S'	P WPP	WAC (C	CintCar	w) (#27)	1	1	1	1
A17540	Process SP NDA-Unc CIN Cans (#58)	Aug-21-13		Aug-21-13	1.00		0.20	3.60					1		1			1	1	1	1	1.0			Une CIN			1	1	1	ļ
A17660	Process SP Multiple Issues CIN Care (#59)	Aug-22-13	1.04	Aug-22-13	1.00		0.20	2.30													1	1.6	rooma S	PMUS	ie hever	adine	Carla (#5	501		1	1
BG Cement	ed Cans - Pit 9	Oct-31-14		Oct-15-14	64.00	0.00	13.31	898.54	0.00	0.00	0.00	0.00															00-31-	-14			1
A18830	Process SP Retrieve and Vent BG Cemented Cens (#32)	06-31-14	13.04	Oct-15-14	64.00		13.31	898.54				-			⊢…+				···		+	+	+-				Process	a SP Re	theve an	liver	t
BG Solid Dr	ums - Pit 9	Oct-14-14	77.04	Jun-25-14	392.00	0.00	60.07	972.11	0.00	0.00	0.00	0.00													-		Oct 14-1-	14		1	ł
A14100	Process SP Retrieve and Vent BQ Solids (#41)	Oct-14-14		Jun-25-14	392.00		60.07	972.11											1								Process		lieve and	Vent	ek.
	ted Monoliths - Pit 9	Jun-24-14		Mar-17-14	361.00	0.00	75.09	30.28	0.00	0.00	0.00	0.00	1	1	1	1	1	1	1	1	1	1	. 1		- 30	n-14-14	4		1	1	Ĩ
A14290	Process SP Retrieve and Vent BG CIN Mon (#42)	Jun-24-14		Mar-17-14	301.00		75.09	30.28											1		1		. 1	- <u>i</u>	-	DOBS S		leve and	Vent Pr	ion.	j
ome 376	(Hall (Hall	Jul-13-15		Apr-18-12	305.00	0.00	1579.73	12704.01	4.00	0.00	42.07	00.00	-+		<u>⊦</u> …∔						<u>+</u>				_					3 15	4
	& Disposition - Legacy Oversized TRU Waste	30-13-15		Apr-18-12 Apr-18-12	305.00	0.00	1579.73	12704.01	4.00	0.00	42.07	69.66	1	1		1							_							3-15	ł
	ess Than 8.2 m3	Nov-21-12		Apr-18-12	60.00	0.00	224.42	83.88	0.00	0.00	0.00	0.00		1			-	1	_	Nov.21					T	1	1		1	1	1
A8755	Process SP RAD Boxes 375 <3.4 m*3 (#44)	Od-16-12		Apr-18-12	50.00	2.00	91.06	8.90	2.00	0.00	3.00	3.00	1	1	!!		- 12	1	1			lane I	75 - 34			1	1	1	1	1	ļ
	FIGURE OF 10-D DURING 27.0 43.4 III-3 (#44)	0001012	145.00	August 12	30.00		21.00	8.90						1	: i								10-201				<u> </u>	<u> </u>	<u> </u>	<u>í </u>	4

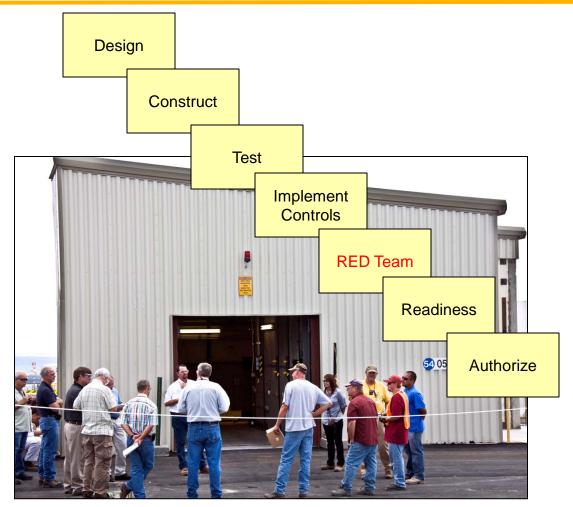
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Readiness Improvements

- RED team process
 - Team of industry experts (multiple sites and corporations)
 - Includes site visits to operating units
 - Deployed prior to MSA
 - Not only identify, but help fix
 - Pilot on High Efficiency RTR
 - Excellent results





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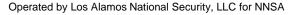
Waste Characterization, Reduction and Repackaging Facility (WCRRF)

- Drum remediation operations authorized at <300 PE Ci ECW
- Glove box fire suppression system installed in 1st Qtr FY11
- Implementation verification review (IVR) to authorize <800 PE Ci planned in FY11
- Control set largely unchanged from 2007 ORR





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RANT (TRU shipping facility)

- Enduring facility
- 12' lifting restriction
- Current annual update being implemented

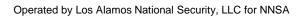




Planned improvements

- Electric trailer jockey (ordered)
- MAR separation (reduced aircraft crash to < 25 rem)
- Pre-assembled payloads
- Enhanced crane PM program

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Dome 231 Permacon

- Sort , segregate and size reduction (SSSR) operations authorized at <2.5 PE Ci ECW
- Prohibition on opening sealed inner glass or metal containers
- Combustible controls (fuel packages and liquid impediments)





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Building 412

- Sort , segregate and size reduction (SSSR) operations authorized at <2.5 PE Ci ECW
- Prohibition on opening sealed inner glass or metal containers
- Combustible controls
- Box remediation operations authorized at <0.52 PE Ci
- Federal readiness assessment in FY11 to upgrade box remediation operations to <2.5 PE Ci ECW





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High Energy Real Time Radiography (HE RTR)

- <90 PE Ci ECW
- Vehicle barriers
- Standard industrial hazards







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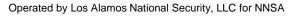


Dome 33 - Drum Venting

- >30' personnel standoff distance
- Non-sparking equipment
- Blast mitigation controls
 - "Doublepack"
 - Lid restraint device









Worker Safety Controls – Trenches A-D

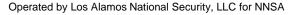
Trenches A-D

- Dirt removal standard controls
- Drum removal critical lift
- Unvented drums vented 55 gal.
 over-pack
- Process in WCRRF existing controls
- MAR control 1,500 PE Ci at retrieval process area
- Limit above grade MAR





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Worker Safety Controls – Trenches A-D

Trenches A-D





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Worker Safety Controls – Trenches A-D

Trenches A-D





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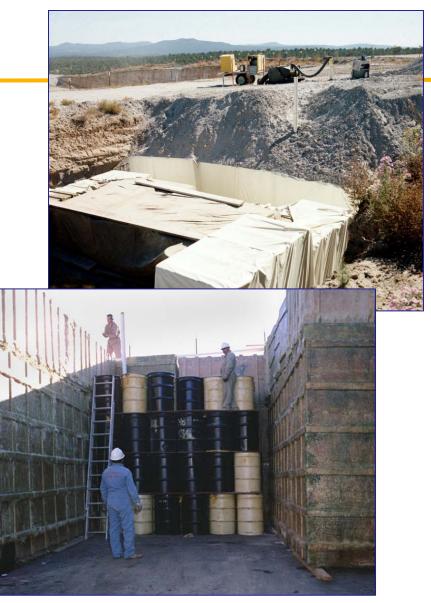
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Worker Safety Controls – Pit 9

Pit 9

- Remove dirt cover in sections standard controls
- Adjust MAR inventory as uncovered
- Assay to ensure TRU
- MAR control 1,500 PE Ci at retrieval process area
- Unvented drums 55 gal. vented over-pack
- Process in WCRRF, Dome 231, Bldg 412, or Dome 375
- Placement occurred when TRU was >10 nCi/gm (Expect large % to be LLW or MLLW)



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Worker Safety Controls – Pit 9





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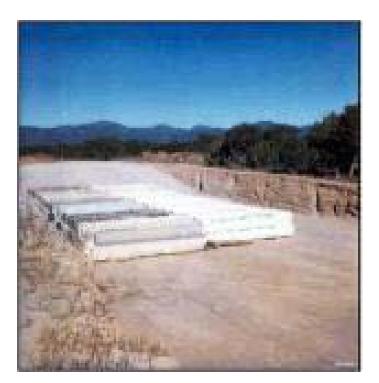
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Worker Safety Controls – Corrugated Metal Pipes (CMP)

Corrugated Metal Pipes (CMP)

- Remove dirt cover in sections standard controls
- Non-combustible and non-dispersible
- Adjust MAR inventory as uncovered
- Divide each 20' long CMP into 5 sections
- Pack into standard waste boxes
- Process in confinement





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Storage Strategy for Newly Generated TRU Waste

- New approach and system plan includes shipping SNG
- Investment in generator's process resulting zero rejects
- Plan is to utilize Area G until new TRUWF is ready





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LANL TRU Program - Reducing Risk





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