



Technology Deployment Initiatives

Savannah River Perspective

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TOPICS



- **Breakthrough Process**
- **Metrics**
- **Technical Assistance Approaches**
- **SRS-ER Technology Process**
- **Deployment Record**
- **Points of Contact**



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Subsurface Contaminants Focus Area Breakthrough 2000

Our Job:

We deliver cost effective solutions for subsurface contamination problems across the complex. We are committed to finding solutions that provide "step change" benefits and to drive those solutions through scientific and technical expertise and technology options.

- ✓ Risk Reduction
- ✓ Return on Investment
- ✓ Multiple Leveraged Applications

Measures of Success:

- ✓ Technical Assistance (40)
- ✓ Dollars Saved (\$100M)
- ✓ Step Change Deployments (40)
- ✓ Written Site Support
- ✓ Feedback

Management Focus:

- ✓ Step Change Improvements
- ✓ Deployments in the Field
- ✓ Technical Expertise
- ✓ User Solutions
- ✓ Cost Savings

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John W. Long *Phillip R. Washer* *Tom Haeman*
Scott R. McMillan *Tom Mich* *Michelle M. Ewart*
Tom H. O'Quinn *Carl Long* *Yardley Boyd*
Cathy Lewis *Ruthie Goraci*

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BREAKTHROUGH PERFORMANCE GOALS



By the end of FY 2001 we are committed to:

- ✓ **100 deployments**
- ✓ **\$500 million in cost savings**
- ✓ **Completion of 100 technical assistance solutions**
- ✓ **Moving at least 10 research projects into the development phase**

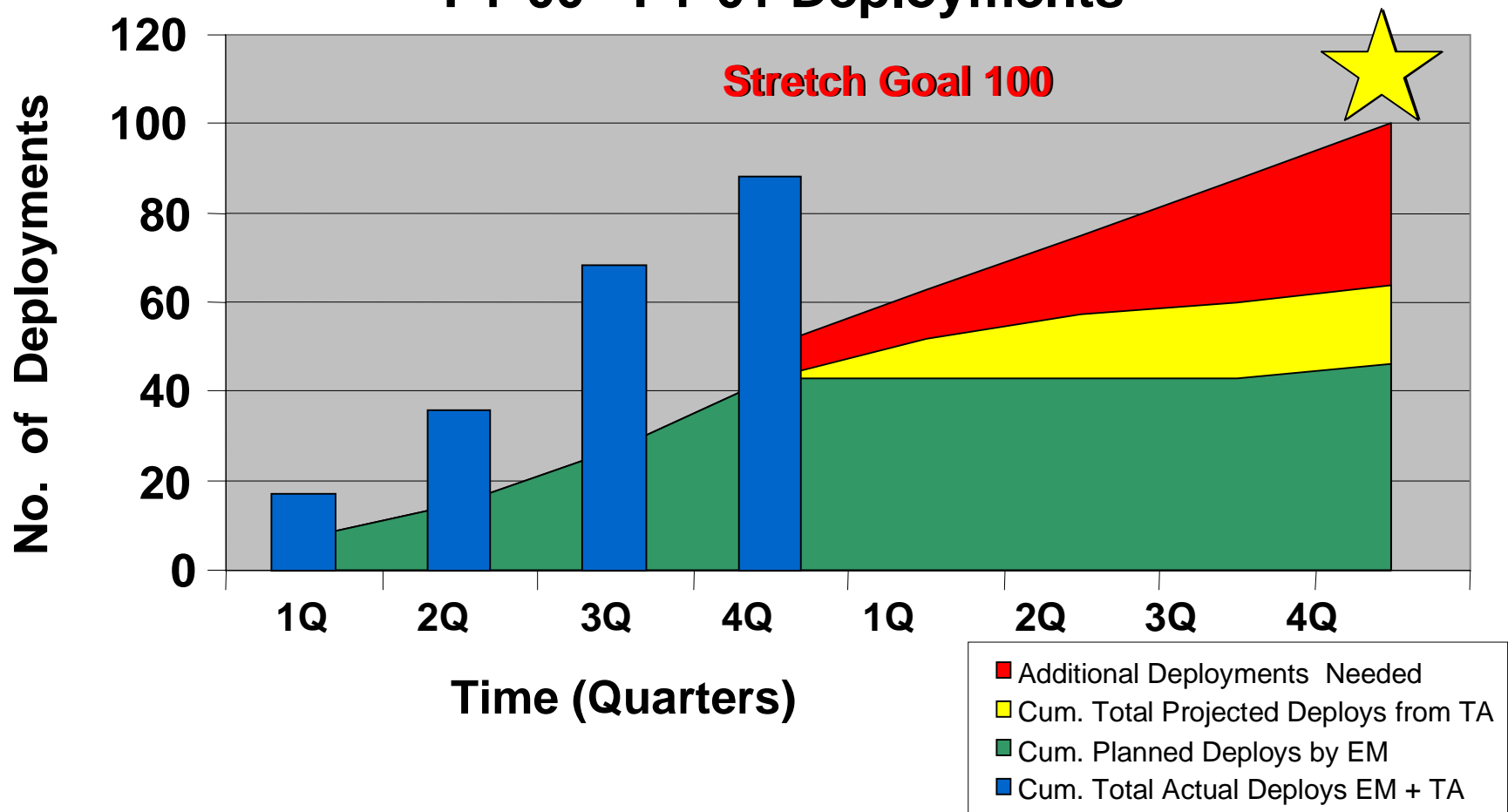
Call us first for Subsurface Solutions!



THE NEED FOR TECHNICAL ASSISTANCE



FY 00 - FY 01 Deployments

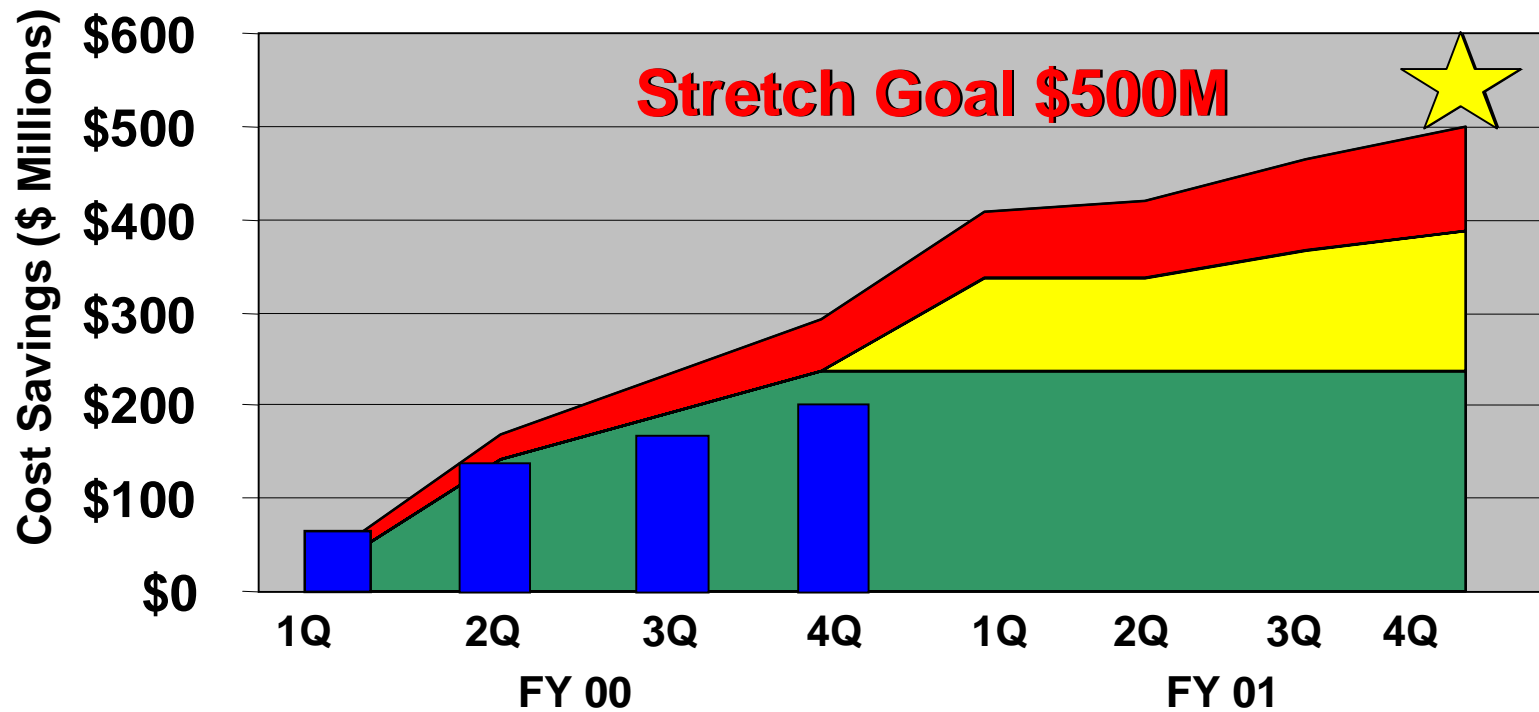




USER-DEFINED COST SAVINGS



FY 00 - FY 01 Total Cost Savings



■ Cum. Planned CS EM
■ Total Cost Savings Needed

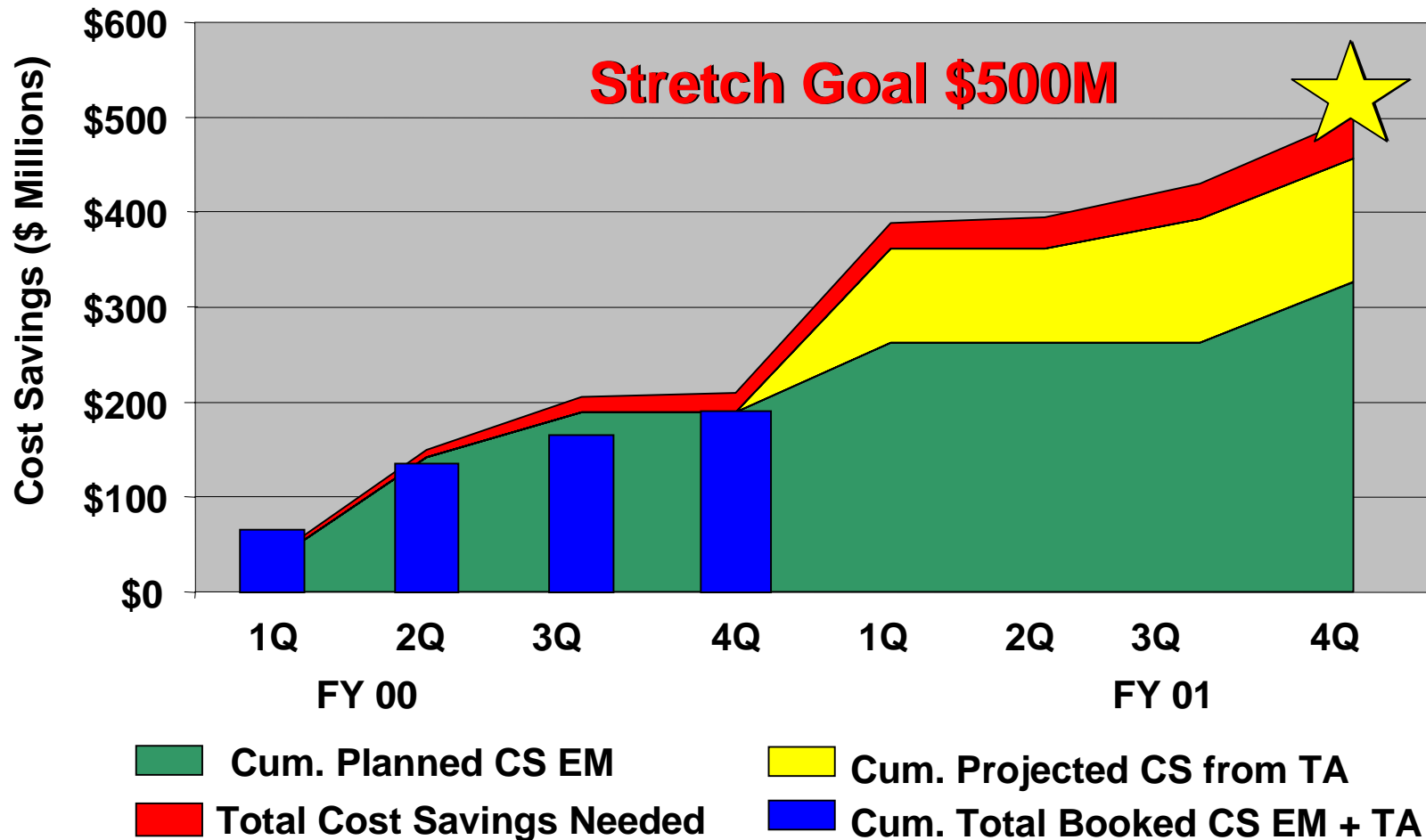
■ Cum. Projected CS from TA
■ Cum. Total Booked CS EM + TA



USER-DEFINED COST SAVINGS - UPDATED

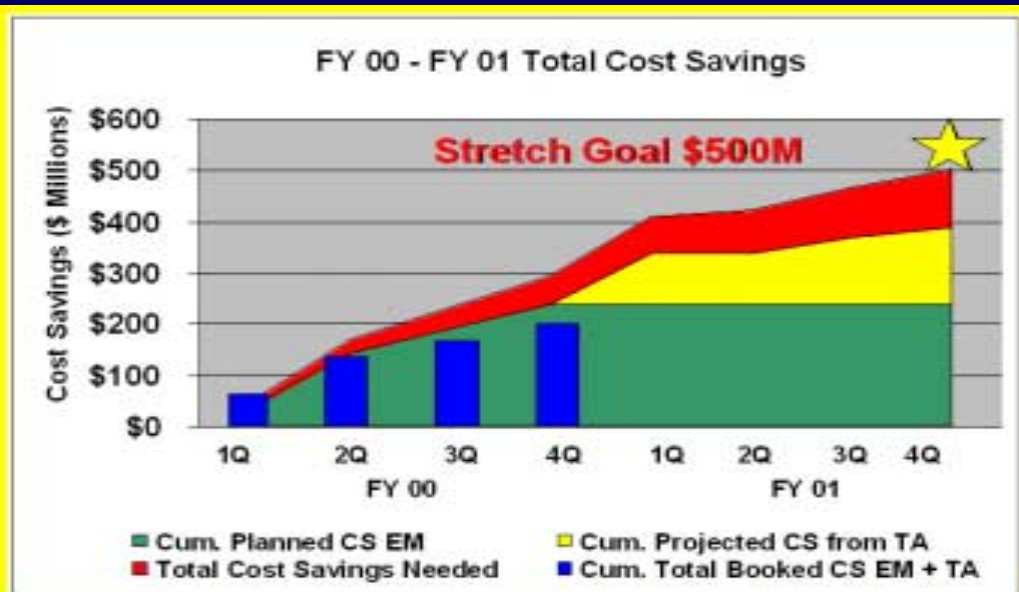


FY 00 - FY 01 Total Cost Savings





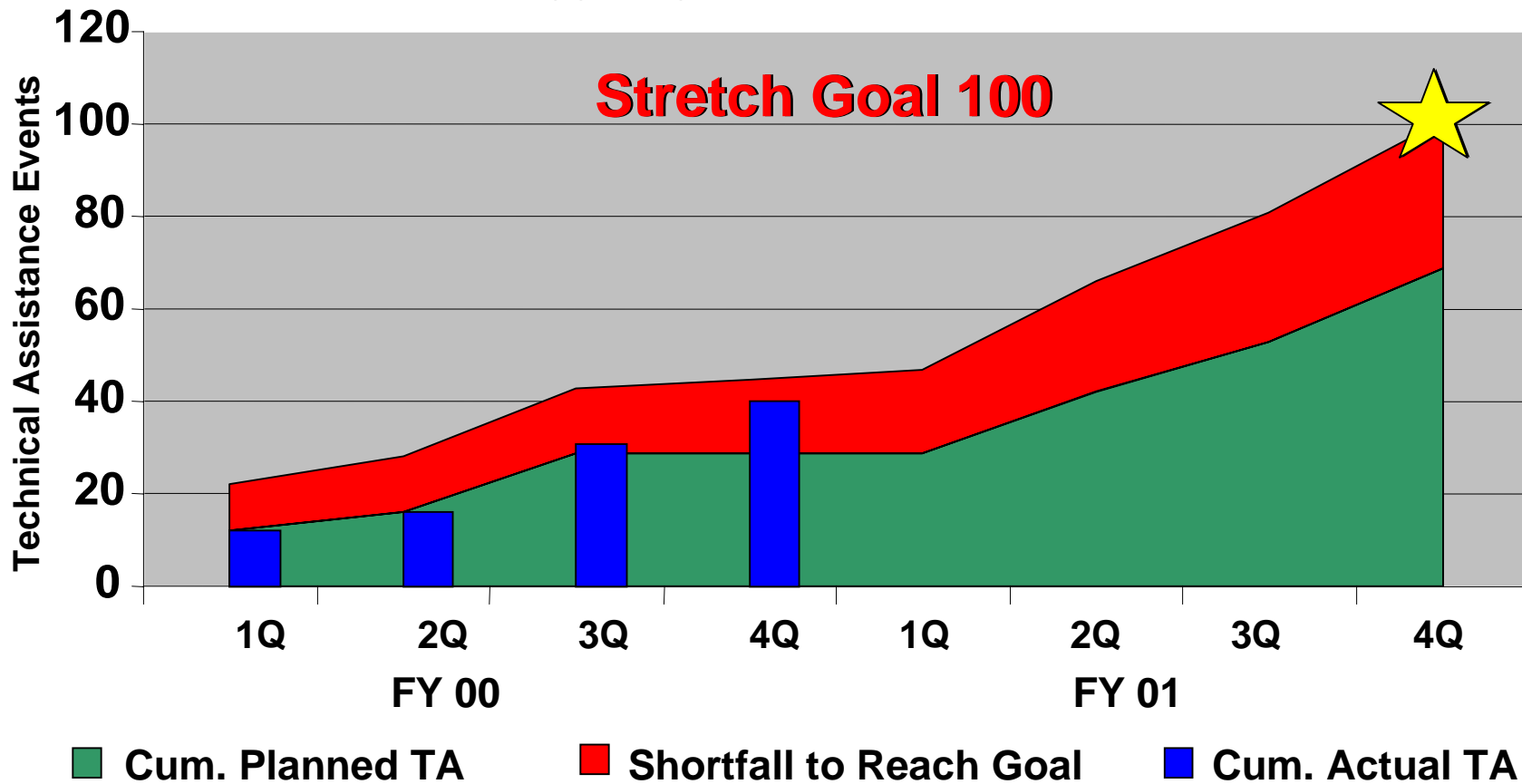
USER-DEFINED COST SAVINGS - UPDATED





THE PLAN FOR TECHNICAL ASSISTANCE

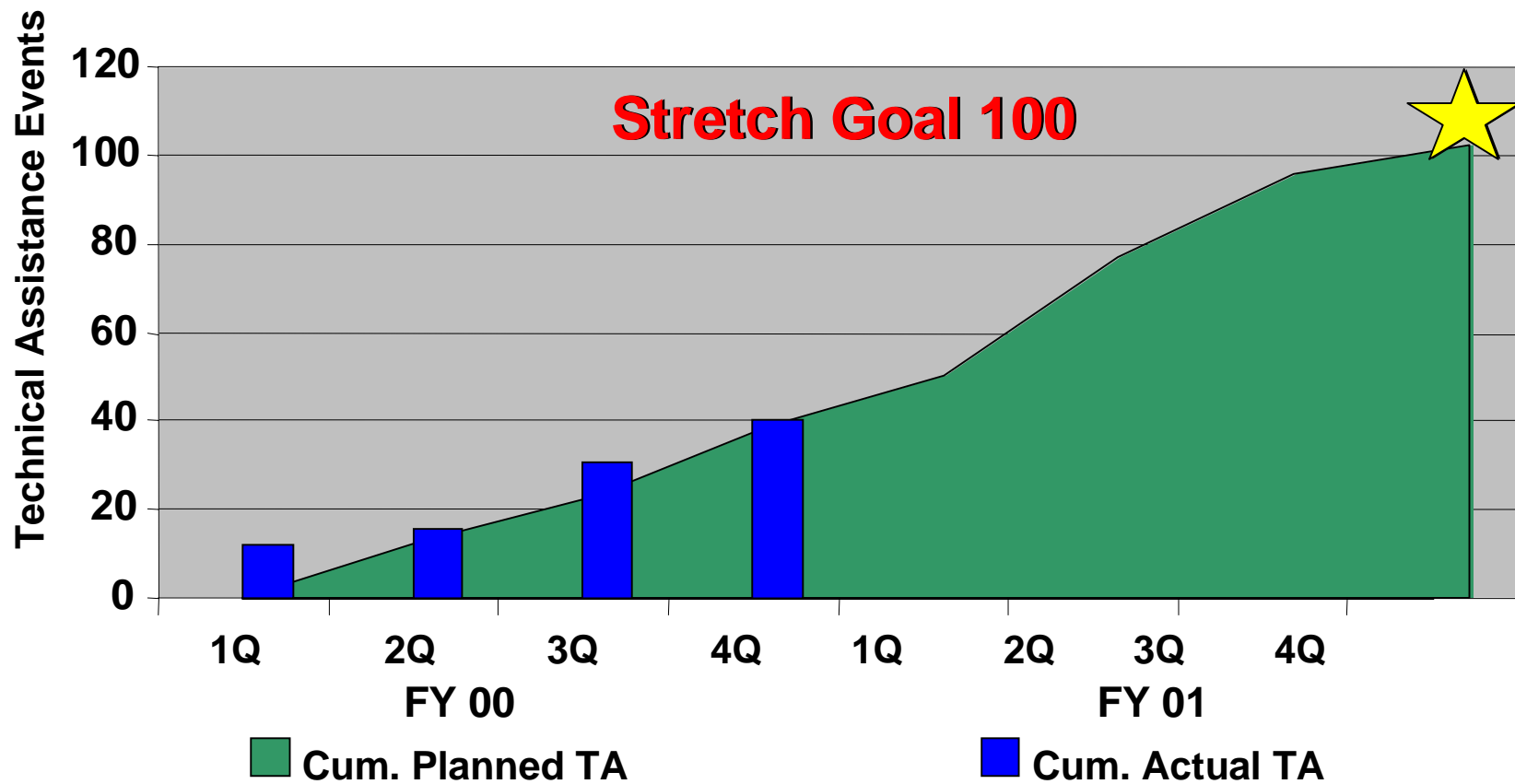
FY00-FY01 Technical Assistance





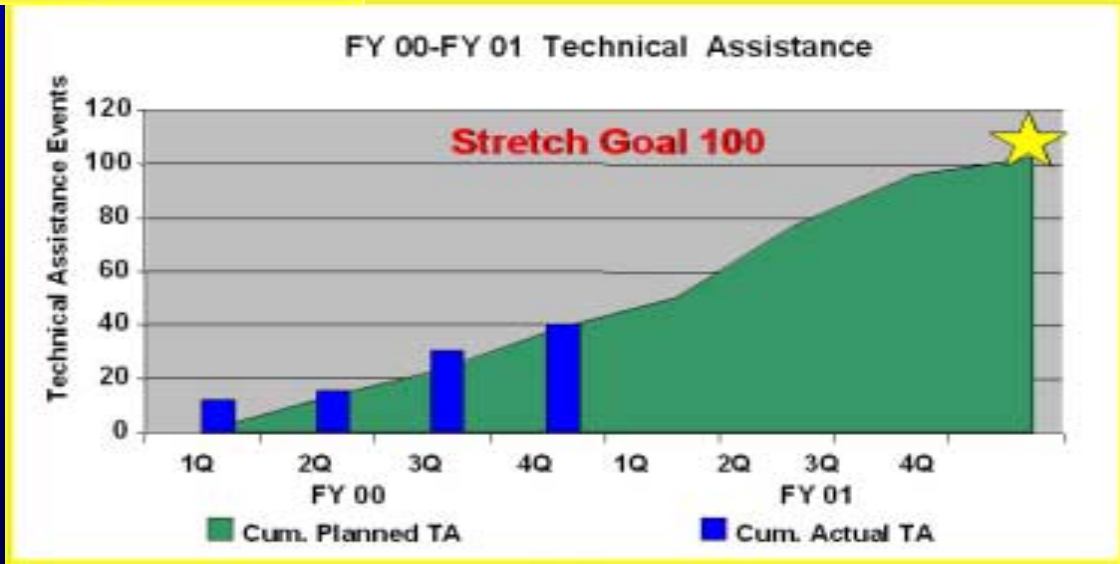
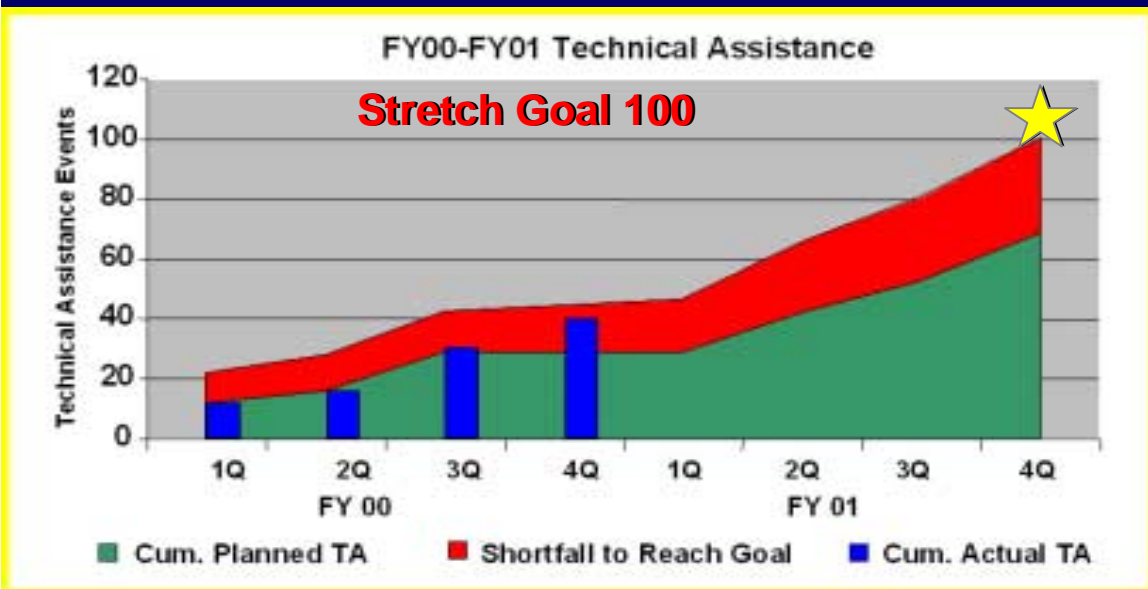
THE PLAN FOR TECHNICAL ASSISTANCE - UPDATED

FY 00-FY 01 Technical Assistance





THE PLAN FOR TECHNICAL ASSISTANCE

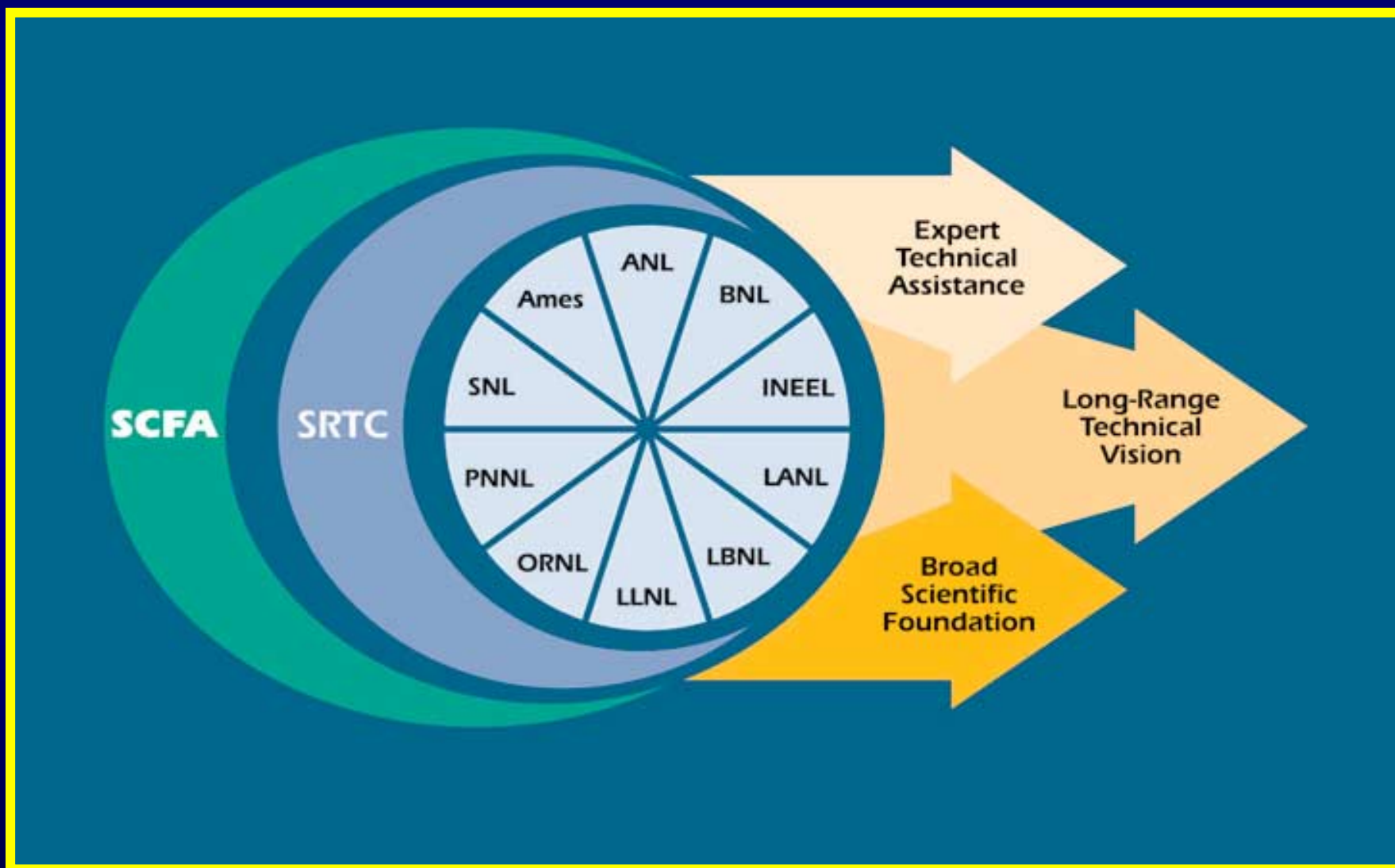




PARTNERSHIPS



HOW WE ARE GETTING IT DONE





LEAD LAB



TECHNICAL ASSISTANCE

- **Response for technical assistance has been very positive**
- **SCFA being recognized at all levels as experts**
- **Being requested to follow-up on previous technical assistance activities**
- **A goal for the TA program is to have technology decision models or baselines used throughout the complex**
- **Similar to the SR model**



*Expand
Focus on
User Needs*



*To Focus on
Problems and
Solutions*



SRS ENVIRONMENTAL RESTORATION TECHNOLOGY DECISION PROCESS



Steam Injection Well Cluster



Dynamic Underground Stripping at 321-M



BASELINE TECHNOLOGIES

COST SAVINGS STANDARDS - EXCERPT



<i>Problem Type</i>	<i>Baseline Technology</i>	<i>Estimated Baseline Quantities</i>	<i>Baseline Unit Cost</i>
Landfills	Kaolin Clay Cap	217 Acres	\$600K / Acre
VOC Contaminated GW	Pump & Treat	6B Gallons of GW	\$5.05 / 1000 Gallons
DNAPLs	Pump & Treat	3.5M lbs of Solvents (225B Gallons GW)	\$5.05 / 1000 Gallons
Analysis	Offsite Analysis	1440 Samples / Year	\$2,550 / Full Suite Analysis (24-Hr. turn-around)



BASELINE TECHNOLOGIES

EXAMPLE COST SAVINGS PLANS



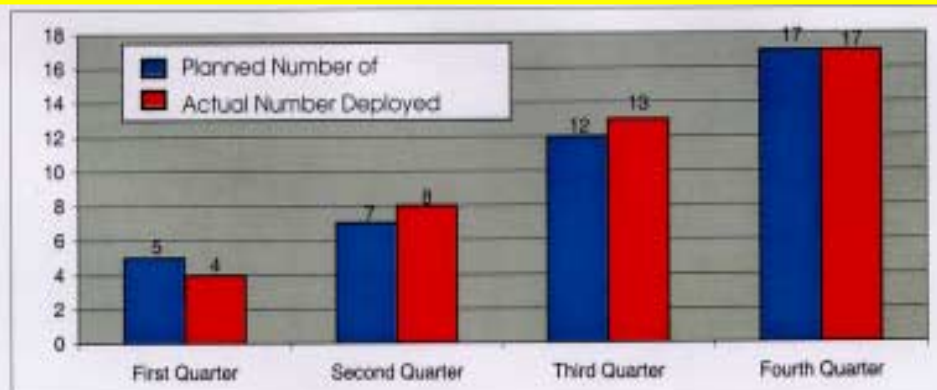
<i>Problem Type</i>	<i>Technology Deployed</i>	<i>Total Estimated LCCE Cost Savings (K)</i>
Landfills	Geotextile Cover	\$17,050
VOC Contaminated GW	Recirculation Well	\$18,773
DNAPLs	Dynamic Underground Stripping (DUS)	\$ 6,655
Analysis	Onsite mobile lab	Up to \$44,851



FY00 ONCE THE DEPLOYMENTS



IN AOP



<u>New Remediation Technologies Planned in AOP</u>	<u>Date Planned</u>	<u>Date Deployed</u>	<u>Site</u>
<input checked="" type="checkbox"/> Dynamic Underground Stripping (DUS)	3Q00	3Q00	321-M Solvent Storage Tank Area
<input checked="" type="checkbox"/> Electrical Resistance Tomography (ERT)	3Q00	3Q00	321-M Solvent Storage Tank Area
<input checked="" type="checkbox"/> Phytoremediation of TCE using Drip Irrigation	4Q00	4Q00	D-Area
<input checked="" type="checkbox"/> Phytoremediation of Tritium	1Q00	4Q00	Burial Ground SW Plume
<input checked="" type="checkbox"/> In-situ Oxidation of VOCs with Ozone (Lynntech)	1Q00	1Q00	A/M-Area
<input checked="" type="checkbox"/> MNA for Chlorinated VOCs	2Q00	2Q00	D-Area Oil Seepage Basin
<input checked="" type="checkbox"/> Soft sided lift liners (vegetation)	1Q00	1Q00	SRL Seepage Basins
<u>Technology Redeployments Planned in AOP</u>			
<input checked="" type="checkbox"/> Pipe Explorer System	1Q00	1Q00	R and C-Area Process Sewers
<input checked="" type="checkbox"/> Purge Water Management System	1-4Q00	1Q00	Site Wide
<input checked="" type="checkbox"/> Pulse Wave (Russian Nitrogen System)	4Q00	4Q00	A/M-Area
<input checked="" type="checkbox"/> Soil Vapor Extraction	3Q00	3Q00	CMP Pits
<input checked="" type="checkbox"/> Multi Level Sampling (Westbay)	4Q00	2Q00	Southern Sector
<input checked="" type="checkbox"/> Solidification & Stabilization of rad. soils	2Q00	2Q00	F-Area Retention Basin
<input checked="" type="checkbox"/> Recirculation Wells (Davis Env.)	3Q00	3Q00	MCB
<input checked="" type="checkbox"/> Soft sided lift liners (soils)	4Q00	4Q00	SRL Basins and CMP Pits
<input checked="" type="checkbox"/> Vert. & Angle Resonant Sonic Drilling	4Q00	2Q00	A/M Area
<input checked="" type="checkbox"/> FLUTe Below the Water Table	3Q00	3Q00	A/M Area

Status Comments:

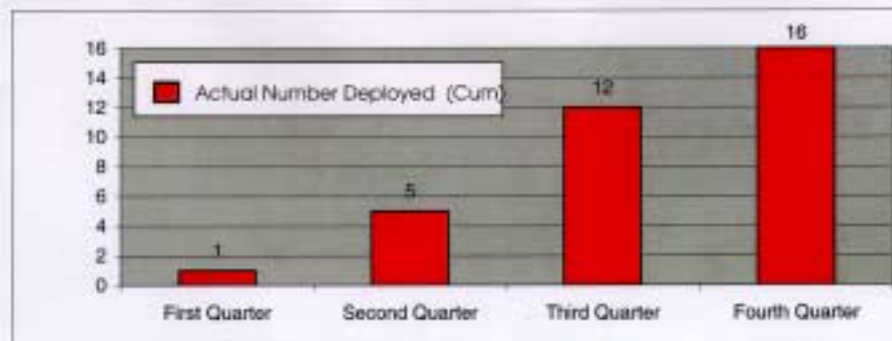
1. Above projects have been fully funded in the FY00 AOP or have EM-50 funding committed for FY00.



FY00 TECHNOLOGY DEPLOYMENTS ABOVE AOP

Savannah River Site Environmental Restoration Program
FY 00 Technology Deployments Above AOP

September 2000



<u>New Technologies</u>	<u>Date Deployed</u>	<u>Site</u>
<input type="checkbox"/> Constructed Wetlands for Metals		488-D Ash Basin
<input type="checkbox"/> Hydrous Pyrolysis		321-M Solvent Storage Tank Area
<input type="checkbox"/> Grouting of Old Solvent Tanks		ORWBG
<input type="checkbox"/> In-situ Bio-remediation Treatability Study		CMP Pits Ballast Area
<input type="checkbox"/> Beneficial Reuse of Ash		K-Reactor Seepage Basin
<input checked="" type="checkbox"/> Electronic Borehole Flowmeter	2Q00	R-Area
<input checked="" type="checkbox"/> Remote Monitoring System	2Q00	D & A/M Areas
<input checked="" type="checkbox"/> Passive Sampler for TCE in Monitoring Wells	1Q00	A/M Area Southern Sector
<input checked="" type="checkbox"/> Passive Sampler for TCE in Wetland Soils	2Q00	C-BRP, A/M Timm's Branch
<input checked="" type="checkbox"/> Wireline CPT Soil Sampler	3Q00	CMP Pits
<input checked="" type="checkbox"/> Sodium Iodide gamma detector for soils	3Q00	SRL Basins
<input checked="" type="checkbox"/> Vibrowell	4Q00	A/M Area
<u>Technology Redeployments</u>		
<input checked="" type="checkbox"/> Pulse Wave Technology	4Q00	C-BRP
<input checked="" type="checkbox"/> Multi Level Sampling (Solinst)	3Q00	MWMF
<input checked="" type="checkbox"/> Multi Level Sampling (Westbay)	3Q00	A/M Groundwater/MCB
<input checked="" type="checkbox"/> StrataSampler	4Q00	A/M Area, Timms Branch
<input checked="" type="checkbox"/> Resonant Sonic Drilling	3Q00	MWMF
<input checked="" type="checkbox"/> MNA for VOCs	3Q00	K-Area Burning Rubble Pit
<input checked="" type="checkbox"/> Field Raman Spectrograph Probe	4Q00	CMP Pits
<u>Technology Improvements</u>		
<input checked="" type="checkbox"/> Baroball Flowmeter	2Q00	A/M Area Met Lab and MCB Met Lab
<input checked="" type="checkbox"/> 3 inch Geoprobe	3Q00	Met Lab

Status Comments:

1. The above technologies were not included in the FY00 AOP

ABOVE AOP



TECHNOLOGY DEPLOYMENT...

ACHIEVING SUCCESS AT SAVANNAH RIVER SITE



FY 99 Completed Technology Demonstrations/Deployments

Funding Source

EM-50

EM-40

In Situ Bioremediation



Non-Rad Waste Disposal Facility

Resonant Sonic Drilling



Old Rad Waste Burial Ground

Phytoremediation of TCE



D-Area, A/M-Area Southern Sector

**Multi-level Sampling in
Deep Monitoring Wells**



A/M-Area Northern Sector

A/M-Area Southern Sector

Pipe Explorer System



C-Area, R-Area Process Sewer



TECHNOLOGY DEPLOYMENT...



ACHIEVING SUCCESS AT SAVANNAH RIVER SITE

FY 00 Completed Technology Demonstrations/Deployments

Funding Source

EM-50

EM-40

Dynamic Underground Stripping



321-M Solvent Storage Tank Area

Electrical Resistance Tomography



321-M Solvent Storage Tank Area

Soft Sided Lift Liners (vegetation)



SRL Seepage Basins

Purge Water Management System



Site Wide

Recirculation Wells



Miscellaneous Chemical Basins



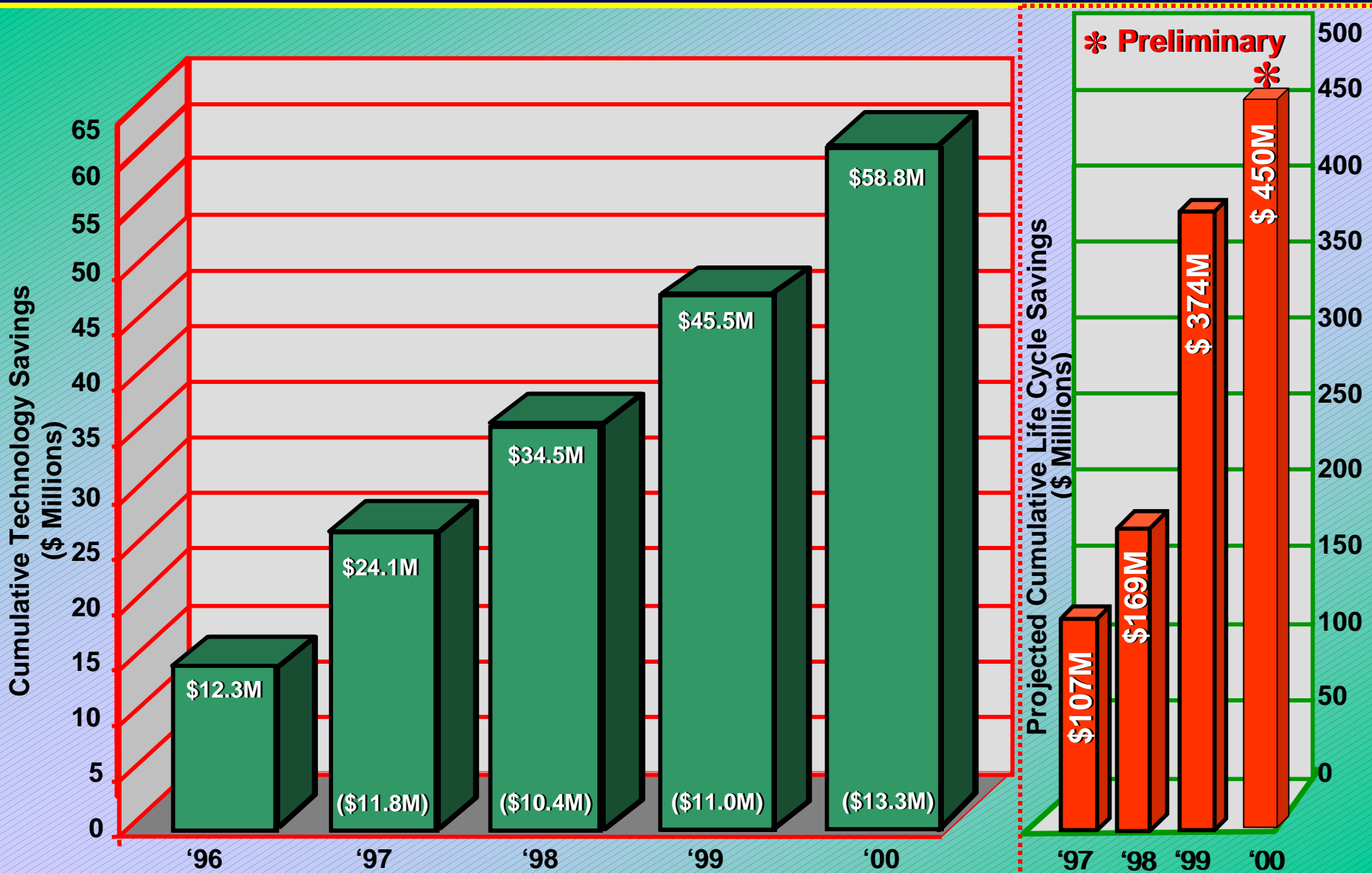
PERFORMANCE BASED INCENTIVES 1995 - 2001



- Utilized PBIs since 1995
- Early conservative PBI was ineffective (“lose-lose”)
- Newer improvements made each year based on experience
- Recent year PBIs drive results in cost savings and deployments



TECHNOLOGY COST SAVINGS AT SRS





FOR FURTHER INFORMATION, CONTACT...



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