

WASTE DESCRIPTION	TYPE OF PROJECT	POUNDS REDUCED, REUSED, RECYCLED OR CONSERVED IN 2006	WASTE TYPE	POTENTIAL COSTS FOR TREATMENT & DISPOSAL	COST OF RECYCLE, PREVENTION	ESTIMATED COST SAVINGS	PROJECT DESCRIPTION DETAILS *
Aerosol Can Disposal System	Recycling	528	66 pounds of hazardous waste per unit	\$7,928	\$900	\$7,028	Allows spent aerosol cans to be recycled scrap metal rather than sent to WMD as hazardous waste currently there are 8 units in use (F&O=5; CA=1; NSLS=1; BES=1)
Formaldetox	Source Reduction	440	neutralized approximately 55 gallons of non-haz waste.	\$2,120	\$0	\$7,000	Neutralizes non-hazardous para-formaldehyde, chlorix, bleach and rat blood
Replacement of BES Mercury Thermometers	Substitution	20	Mercury	\$2,350	\$1,000	\$1,350	Approximately 20 lb of mercury-containing thermometers were removed from BES laboratories during 2006. Savings are based on the cost of one mercury spill and cleanup.
HPLC Solven Recycler	Reuse	110	Hazardous Waste	\$1,755	\$2,675	\$6,755	Allows the reuse of approximately 50 liters of solvent and the cost savings of approximately 50 man-hours of labor
Propane Cylinder De-Valver	Recycling	50	Hazardous Waste	\$3,750	\$950	\$2,800	Collider Accelerator purchased a propane cylinder De-valver. If the cylinders were not de-valved they would have to go to a vendor for disposal at \$75/cylinder. Once the valve is de-valved it can be recycled as scrap metal.
Fluorescently Labeled Oligonucleotides	Waste Minimization	3,144	396 ft3 of rad waste; 35 gal of mixed waste; 108 gal of haz waste	\$67,600	\$14,000	\$43,370	This project was cost shared with Biology. This process avoids the use of radioactivity, and hence the avoidance of rad waste generation.
Electronic Recycling	Recycling	140,600	E-Waste	N/A	\$1,200	N/A	Previously the Laboratory's e-waste was collected by the scrap metal dealer, but the recycling process was questionable. BNL has partnered with a governmental based e-waste recycler that take the product for free, but the Lab pays shipping.
Disposal of #6 Fuel oil and Turkey Based Biofuel	Energy Rcovery	12,000	Industrial Waste	\$30,000	\$500	\$29,500	1500 gallons of #6 fuel oil and biofuels accepted from EENS as fuel stock for the Steam Facility
Electronic Barometer	Substitution	3	Mercury	\$2,350	\$1,800	\$550	Approximately 3 lb of a mercury-containing tbarmeter was removed from EENS during 2006. Savings are based on the cost of one mercury spill and cleanup.
Building Demolition Recycling	Recycling	11,080,000	Industrial Waste	\$748,680	\$32,000	\$716,680	Segregation, recycling and reuse of on-site building demolition products (steel and concrete)
System One Parts Cleaner	Substitution	640	Hazardous Waste	\$4,000	\$2,800	\$1,200	Plant Engineering purchased a System One parts washer which re-distills the solvent when dirty. The removed grit and sludge is mixed in with the waste oil. This system eliminates the need for a vendor such as Safety Kleen.
Photon Counting Spectroflurometer	Substitution	54	2 ft3 of mixed waste and 1000 man-hours	\$10,540	\$0	\$25,540	Eliminated the need for radioactive assays and the subsequent generated radioactive waste. Cost savings include 1000 man-hours and savings on material costs
Replacement of Mercury Utility Devices	Substitution	40	Mercury	\$2,350	\$4,000	\$2,350	Approximately 40 lb of mercury-containing devices were removed from utility devices during 2006. Savings are based on the cost of one mercury spill and cleanup.
Animal Bedding Conveying System	Composing		25 yds3 of LLRW	\$189,000	\$5,000	\$184,000	Animal bedding material is no longer sent to sanitary - it is now conveyed to a dumpster which is emptied/composted at the stump dump.
Halogen 1211 Fire Extinguisher S	Substitution	1,700	Reduction of Halogenated Ozone Depleting Substances	\$4,000	\$6,200	\$4,000	1985 pounds of halogen 1211 removed from service and replaced with non-ozone depleting substances
EP Grounds Vehicle Wash *	Waste Minimization	8,000	oils/grease to soils	\$16,000	\$1,000	\$16,000	This is a multi-year / multiple Department funded initiative that will eliminate the potential of oil and grease being released to soil
Organic Solvents	Substitution	678	Hazardous Waste	\$1,694	\$0	\$26,000	Life Sciences purchased a Microwave Peptide Synthesizer in 2004 to significantly reduce the amount of hazardous wastes generated. Saves ~1,000 work hours/year (reflected in cost savings).
Organic Solvents	Purification/Reuse	44	Hazardous Waste	\$110	\$0	\$3,510	The primary cost savings of the BES solvent purification system is in not purchasing new solvent and man-power savings in not running the stills.

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Cooling Water	Reuse	63,400	Deionized water	\$0	\$0	\$7,925	A closed-cycle water recycling system for the Building 480 melt spinner saved 7,925 gallons of ultra-pure water and extends the life expentancy of equipment worth \$100,000.
Mercury Utility Devices	Substitution	10	Mercury	\$2,300	\$0	\$2,300	Plant Engineering replaced mercury-containing utility devices with non mercury-containing equipment in 2006. Savings are based on the cost of one mercury spill and cleanup.
Radioactive Waste	Source Reduction	1,500	Radioactive Waste	\$6,000	\$0	\$6,000	A sorting table was purchased in 2003 for the Waste Yard, so clean waste could be sorted from radioactive waste.
Radioactive Emissions	Emission Reduction	0	Radioactive Emissions			\$0	A shroud was installed over the 16-inch diameter shaft in the Hot Cell of the BLIP, isolating cooling water from the rapidly moving air of the exhaust system and allowing radiological decay within the water system. Slowing the diffusion into the hot cell air will effectively reduce gaseous emissions into the exhaust stack, as these radionuclides have very short half lives. The shroud/enclosure has been instrumental in reducing short-lived radioactive gaseous emissions. Beyond the environmental benefits associated with the project and due to the efficiency of the enclosure in reducing emissions, the facility has been able to stay below the emissions level that would require additional regulatory burdens.
Radioactive Waste generated through wet chemistry	Waste Minimization	30	Mixed waste / Liquid Radioactive Waste	\$17,600	\$0	\$22,500	The purchase of a Kinetic Phosphorescence Analyzer (KPA) system for uranium analysis eliminated mixed waste generation in this chemistry laboratory, reduced by 90% the volume of liquid waste, reduced by 90% the amount of radioactive material handled, minimized exposure to uranium by laboratory personnel, and decreased labor time by 75%.
Radioactive Waste from labeled chemicals	Waste Minimization/ Volume Reduction	0	Solid Radioactive Waste	\$2,168	\$0	\$2,168	A vial crusher for glass vials, pipettes, and other glassware was purchased to reduce volume of rad waste.
Radioactive and Mixed Wastes from radio-labeled chemicals	Waste Minimization	112	Mixed Waste	\$27,690	\$0	\$27,690	A microplate scintillation counter was purchased to to reduce mixed waste generation.
Pump Oil	Substitution	51	Hazardous Waste / Industrial Waste	\$3,520	\$0	\$3,520	Oil-displacement pumps were replaced with dry pumps for both laboratory and aircraft missions.
Electrophoretic Mini-Gels	Microscale Chemical Use	2,200	Hazardous Waste - Lab Pack	\$11,500	\$0	\$11,500	This system minimizes silver waste from silver-staining electrophoretic mini-gels. Savings reflect avoided waste disposal costs and lower material purchase costs (\$6,000).
Sewage Sludge	Volume Reduction	18,450	Radioactive Waste	\$387,450	\$0	\$387,450	Disposal of 60,000 gal of radioactive STP liquid waste by a contractor would cost \$910,000. Instead, the waste is dried using rolloffs, absorbent, and lime and shipped via rail to a disposal facility. A second drying bed was built to dry sludge (96% volume reduction) from the anaerobic sludge digester.
Film and other radioisotopic imaging	Substitution	300	Hazardous Waste / Industrial Waste	\$22,000	\$0	\$22,000	Replacement of film-based autoradiography and other radioisotopic imaging with a Phosphor Imager reduced hazardous waste generation by 200 lb and industrial waste generation by 100 lb. Additional projected savings are in annual supply costs and labor reduction.
Lead Acid Batteries	Recycled	11,000	Hazardous Waste	\$27,500	\$0	\$27,500	Estimate 40 lb/battery and avoided disposal costs as hazardous waste.
Ion Exchange wastewater	Source Reduction	1250	Hazardous and Sanitary Wastewater	\$3,125	\$0	\$3,125	Prefilters, added to the deionization system, polish makeup water entering the ion exchange system. This extends the useful life of the ion exchange resins, requiring less frequent regeneration. The regeneration process generates hazardous and sanitary waste.
Short Half-life waste	Decay in Storage	495	Radioactive Waste	\$20,558	\$0	\$20,558	Short half-life isotopes, particularly phosphorus-32 and phosphorus-33, are frequently used in life sciences experiments. In 2006, wastes from these operations (29 ft3 and 345 lbs of liquid) were managed in accordance with BNL decay-in-storage requirements, rendering the wastes eligible for volumetric release.

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Lubricating Oil	Energy Recovery	7,200	Industrial Waste	\$18,000	\$500	\$15,750	In 2006, ~7,200 lb (900 gal) of lubricating oils and heating fuels were collected, tested for suitable for use as waste oil fuel, and used for energy production at the Central Steam Facility. Avoided disposal cost was \$14,400. Cost of testing (\$500) was offset by fuel use savings (\$1.50/gal).
Cooling Tower Chemicals	Source Reduction	9,563	Industrial Waste	\$22,500	\$0	\$22,500	In 2001, ozone water treatment units were installed on cooling towers at two RHIC experiments to provide biological control of cooling water. These systems eliminate the need for water treatment chemicals (typically toxic biocides), save labor, and reduce analytical costs for monitoring cooling tower blowdown. In 2002 the SEM and NSRL systems had ozone water treatment units installed and in 2003 the RF system at RHIC had an ozone system installed. Currently the RHIC RF, SEM and NSRL systems are are operational awhile the RHIC BRAHMS & PHOBOS systems are not operating as the experiments have ended.
Blasocut Machining Coolant	Recycled/Reused	31,760	Industrial Waste	\$83,300	\$0	\$89,700	Central Shops Division operates a recycling system that reclaims Blasocut machining coolant and supplies it labwide. 3,970 gal (31,760 lb) of Blasocut lubricant were recycled in 2006. Recycling involves aeration, centrifuge, and filtration. This avoids cost of disposal as industrial waste plus an avoided cost of procurement of 8 drums of concentrate (\$800/drum) and 78 drums for waste (\$50/drum).
Used Motor Oil	Energy Recovery	22,240	Industrial Waste	\$58,150	\$0	\$58,150	Used motor oil from the motor pool and the on-site gas station is picked for free up by Strebel's Laundry Service and used to fire their waste oil boilers. In 2006, 2,780 gal of oil were picked up, avoiding cost for disposal and 51 drums for shipping (\$50/drum).
Office Paper	Recycled	368,000	Sanitary Waste	\$18,400	\$0	\$18,400	Estimate \$100/ton for disposal as trash.
Cardboard	Recycled	270,000	Sanitary Waste	\$13,500	\$0	\$13,500	Estimate \$100/ton for disposal as trash.
Scrap Metal	Recycled	316,000	Sanitary Waste	\$15,800	\$0	\$15,800	Estimate \$100/ton for disposal as trash.
Bottles/Cans	Recycled	56,000	Sanitary Waste	\$2,800	\$0	\$2,800	Estimate \$100/ton for disposal as trash.
Construction Debris	Recycled	594,000	Sanitary Waste	\$13,365	\$0	\$13,365	Estimate \$45/ton for avoiding disposal as trash.
	TOTALS	13,021,612		\$1,871,453	\$74,525	\$1,871,834	

* Cost savings of projects funded by the BNL Pollution Prevention Council will be tracked for three years.