MARTIN MARIETTA

**1994 Annual Report on Waste Generation
and Waste Minimization Progress
as Required by DOE Order 5400.1**

October 16, 1995

Y-12 Pollution Prevention Program Office

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Prepared by the
Oak Ridge Y-12 Plant
Oak Ridge, Tennessee 37831
managed by
Lockheed Martin Energy Systems, Inc.
for the
U.S. DEPARTMENT OF ENERGY

MANAGED BY
MARTIN MARIETTA ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

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Standard Data Report

1994 Annual Report on Waste
Generation and Waste Minimization
Progress
as Required by DOE Order 5400.1

Oak Ridge Y-12 Plant
State: TN
Operations Office: OR

Prepared for:

The Department of Energy Headquarters

Prepared by:

Oak Ridge Y-12 Plant
Oak Ridge, Tennessee 37831
Managed by
Lockheed Martin Energy Systems, Inc.
for the
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Signature Page

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I. Executive Summary

The Y-12 Plant received two Department of Energy (DOE) Pollution Prevention (P2) Awards for activities conducted in CY 1994 for Zero Generation - Cooling Tower Ozone Generator and Public Outreach and Achievement - Protecting the Environment with Refrigerant Management Awareness. In addition, the "Cooling Tower Ozone Generator" and "Y-12 Chlorofluorocarbon (CFC) and Halon Replacement Program for Stratospheric Ozone Protection" won the White House Closing the Circle Award for source reduction efforts put in place during CY 1994. The Cooling Tower Ozone Generator at Y-12 was installed in 1993 and was operated at essentially "zero discharge" during CY 1994. The Ozone Generator has eliminated the procurement and use of all chemicals used to treat the cooling tower water, and chemical discharges into East Fork Poplar Creek have been eliminated for all practical purposes. The Ozone Generator has provided more effective control of bacteria, biofouling, carcinogenic compounds, and corrosion control than the conventional treatment systems. The Y-12 Plant was the first DOE DP facility to develop a long range Stratospheric Ozone Protection plan to minimize Plant emissions of all class I and II ozone-depleting substances (ODS), maximize the use of ozone-friendly alternatives, and achieve cost-effective compliance with the EPA's Clean Air Act. Preliminary calculations of this project indicate an annual savings of approximately 2,658,000 kilowatt-hours which amounts to approximately \$125,500 per year in FY93-94 dollars. In addition, The Plant's CFC emissions were reduced by more than 68% from 1992 levels due to these efforts.

The Y-12 Plant received DOE Headquarters approval and funding for six P2 Projects which demonstrated a "Return on Investment." Out of 2.2 million committed to this effort, the Y-12 Plant received 1.7 Million. Therefore, the Y-12 Plant has been selected to model and evaluate the program established at DOE Headquarters. Money has been allocated for six Y-12 Plant projects. The projects will result in the reduction of 694,412 pounds of low level waste/year; 4,750 pounds of RCRA Hazardous waste/year; and 84,000 gallons on mixed low level waste/year. And, the projects will result in a total cost savings of approximately 3.3 million/year.

At Y-12 the awareness program seeks to involve every employee in the P2 decision making regardless of their specific job duties. The awareness program is an ongoing, continual effort to educate employees. There are several activities which are conducted every year and several activities, constituting a larger, more focused effort, that are conducted less frequently. During CY 1994, the P2 Awareness Program published a bimonthly Newsletter, sponsored an Earth Day Celebration, sponsored Pollution Prevention Opportunity Assessment (PPOA) training, sponsored technical forums, and conducted management walkthroughs.

During CY 1994, external awareness activities included reaching out to local schools, colleges, and small businesses with environmental messages. The community has shown great interest for information on general environmental issues and P2 principles. External activities included: Environmental Fair, Woodland Elementary School outreach, Professional Awareness and Appreciation Program Presentations, and Teleconference via satellite, to community colleges across a seven-state area.

Organizational P2 activities included the completion and distribution of the Y-12 Plant P2 Program Procedure Y70-311; populating and validating the P2 projects database listing over 100 P2 projects in various stages of implementation for CY 1993 and CY 1994. P2 self-assessments were completed by the line organizations, based on the P2 Program work breakdown structure and provides the demonstration of elements for an effective P2 Program. In addition, a listing Of Y-12 processes were received from line organizations and used to evaluate the need for PPOAs. Former PPOAs were reviewed to determine which processes needed further evaluation for P2 opportunities.

II. General Site Information

General Site Mission

The Y-12 Plant serves as a key manufacturing technology center for the development and demonstration of unique materials, components, and services of importance to the Department of Energy (DOE) and the nation. This is accomplished through the reclamation and storage of nuclear materials, manufacture of nuclear materials, manufacture of components for the nation's defense capabilities, support to national security programs, and services provided to other customers as approved by DOE. We are recognized by our people, the community, and our customers as innovative, responsive, and responsible. We are a leader in worker health and safety, environmental protection, and stewardship of our national resources. As a DOE facility, Y-12 also supports DOE's waste minimization mission.

Mailing Address

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 Building 9704-2, Mailstop 8009
 Oak Ridge, TN 37831

Lead CSO

DP

Additional CSOs

AD	CR	DP	EE	EM	ER	ET	FE	HR	NE	NN	PM	RW
				X								

Site Size (acres)

800

Number of Employees
DOE

175

Contractor

5376

Data contained in this report represents waste generation in the following states(s):

TN

III. Introduction

Introduction to Site Generation Data

Information regarding pollution prevention (P2) projects was gathered on pollution prevention activity report forms completed by the implementing organization P2 advocate and project contact. Information gathered includes specific organization and project information detailing the project description and implementation plan; waste information pertaining to waste form, type, P2 techniques used, and quantity and/or toxicity reductions; and the associated budget and cost savings information pertaining to the project. Subsequent updates are provided on a quarterly basis from each respective P2 advocate. Only projects that were completely implemented in CY 1994 are included in the report. All activities using pollution control or treatment methods were excluded from this report.

The following information documents base assumptions used in analyzing and/or characterizing waste generation data:

Non-routine waste is identified as waste that is PCB contaminated, any waste generated by Environmental Restoration activities, and any waste identified as "legacy waste". Secondary waste could not be readily identified.

All other wastes are identified as routinely generated.

Process waste waters are identified as all liquid wastes treated in existing onsite waste water treatment facilities.

All wastes characterized as RCRA-hazardous are identified as Mixed-LLW, as presented in the Mixed Waste Inventory Report (MWIR), due to suspect and/or demonstrated radioactive contamination.

Similarly, all PCB-contaminated wastes are presented as Mixed-TSCA, excluding those PCB contaminated wastes which are also RCRA-Hazardous. These RCRA/PCB wastes are presented as Mixed-LLW, as presented in the MWIR.

Sanitary waste generation includes those wastes managed in onsite industrial landfills, and those sent to local commercial sanitary landfills. Asbestos waste is included in this category.

Scrap metal generation is not presented in waste generation categories.

All wastes generated by the Oak Ridge National Laboratory (ORNL) facilities located at the Y-12 Plant are not presented in Y-12 waste generation information, but have been incorporated in the ORNL facility report submission.

Mixed-TSCA is included with Mixed-LLW numbers for the Inventory waste data as of 12/93.

IV. Site Generation Data

Table 1.0 Total Waste Generated in 1994
as Packaged for T/S/D
(does not include process wastewater)

Waste Type	Liquid	Solid	Total	Inventory* Waste (as of 12/93)
High Level Waste	0 m3	0 m3	0 m3	0 m3
Transuranic Waste (TRU)	0 m3	0 m3	0 m3	0 m3
Mixed-TRU	0 m3	0 m3	0 m3	0 m3
Low-Level Waste (LLW)	4.45 m3	2100 m3	2104 m3	4640 m3
Mixed-LLW	156 m3	105 m3	261 m3	17100 m3
RCRA Regulated		0 mt	0 mt	0 mt
State Regulated		0 mt	0 mt	0 mt
TSCA Regulated		0 mt	0 mt	0 mt
Mixed-TSCA		25.9 mt	25.9 mt	0 mt
Sanitary		21400 mt	21400 mt	

* Total waste generated at the site during calendar year 1994, which is a sum of all wastes generated, regardless of source or activity; also provided for reference is the total amount of waste in inventory at the site, as of 12/93.

IV. Site Generation Data (cont.)

Table 1.1 Amount of Waste Generated in Other States
by this Site's Operations or Activities

You have indicated that you are reporting waste for only 1 state.
Therefore, this page is intentionally blank.

IV. Site Generation Data (cont.)

Table 2.0 Routine * vs. Non-Routine ** Waste

Waste Type		Routine	Non-Routine	Total
High Level Waste	(L)	0 m3	0 m3	0 m3
	(S)	0 m3	0 m3	0 m3
Transuranic Waste (TRU)	(L)	0 m3	0 m3	0 m3
	(S)	0 m3	0 m3	0 m3
Mixed-TRU	(L)	0 m3	0 m3	0 m3
	(S)	0 m3	0 m3	0 m3
Low-Level Waste (LLW)	(L)	4.45 m3	0 m3	4.45 m3
	(S)	2062 m3	36.8 m3	2099 m3
Mixed-LLW	(L)	151.6 m3	4.47 m3	156.1 m3
	(S)	89.8 m3	15.18 m3	105.0 m3
RCRA Regulated		0 mt	0 mt	0 mt
State Regulated		0 mt	0 mt	0 mt
TSCA Regulated		0 mt	0 mt	0 mt
Mixed-TSCA		0 mt	25.9 mt	25.9 mt

Total waste generated at the site during calendar year 1994, which is a sum of all wastes generated regardless of source or activity

* Routine waste is defined as waste produced from any type of production operation, analytical and/or R&D laboratory operations; T/S/D operations, "work for others", or any other periodic and recurring work that is considered on-going in nature.

** Non-Routine waste is defined as one-time operations waste: Wastes produced from environmental restoration program activities, including primary and secondary wastes associated with retrieval and remediation operations; "legacy wastes"; and D&D/Transition operations.

IV. Site Generation Data (cont.)

Table 2.1 Process Wastewater* Generation

Waste Type	Volume (1000 Liters)= 1 m3
High Level Waste	0 m3
Transuranic Waste (TRU)	0 m3
Mixed-TRU	0 m3
Low-Level Waste (LLW)	835 m3
Mixed-LLW	10900 m3
RCRA Regulated	0 m3
State Regulated	0 m3
TSCA Regulated	0 m3
Mixed-TSCA	0 m3
Sanitary	231000 m3

Total waste generated at the site during calendar year 1994, which is a sum of all wastes generated regardless of source or activity

* Process Wastewater is defined as any water produced during manufacturing or processing operations which comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, by-product, or waste product. This determination is independent of the level and/or nature of the contaminants.

V. Site-Wide WMIN Accomplishments

Recycling Programs. The Y-12 Plant as a whole initiated and completely implemented ten recovery or recycle projects during the CY 1994. The plant recycling program established the means for recycling 1) cardboard, 2) file folder waste, 3) mixed paper waste, and 4) aluminum beverage cans. The funds collected from the aluminum beverage can recycling program were given to local charitable and non-profit organizations which were nominated by individuals from the site. 5) The Y-12 Plant also committed to a recycling program for printer toner cartridges. A replacement cartridge was found that comes with three additional refills in its toner cartridge box, thus reducing the frequency to send the cartridges offsite for recycling. 6) An Olathe Tub Grinder was purchased and is used to recycle wood at the Y-12 Plant. Non-contaminated, non-pressure treated scrap wood is processed through a ten foot tub grinder to produce mulch. The mulch reduces landscaping costs, improves site appearance, and drastically increases landfill capacity. 7) Y-12 is committed to recycling scrap metal which eliminates handling the scrap as RCRA wastes and saves landfill space for non-RCRA waste. 8) The Swap Shop was established to allow employees having surplus materials (both hazardous and nonhazardous) to list these products on an electronic mail message system with the possibility of finding a user for the material, and arranging a transfer or swap between organizations rather than having to dispose of surplus usable materials. The benefit of this projects is savings on waste disposal costs, material costs, and potential for significant contribution toward waste reduction/waste minimization goals. 9) Lead solids, such as lead acid batteries, are collected and recycled off-site. 10) Precious metal waste such as silver was recovered during CY 1994.

Training Program. The Y-12 P2 Program sponsored training for the P2 advocates on how to conduct Pollution Prevention Opportunity Assessments (PPOAs). A priority listing was developed for Y-12 specific application and was distributed at the training to aid in the determination of the level of assessment that should be conducted for a particular process. The P2 Program outlined the development of a training video spotlighting P2 activities at Y-12. The purpose of the video is to educate general employees on what P2 is and how they can get involved entitled "Y-12 Pollution Solutions".

Employee Awareness. Over 1500 employees participated in a month long P2 celebration that included six P2 technical forums and an Earth Day Celebration held on the grounds of the cafeteria. A newsletter, Y-12 Pollution Solutions, was issued throughout the year which communicated to general plant employees specific issues regarding Y-12 environmental and pollution prevention problems, along with recycling information, general household tips on how to prevent pollution, and recognition for pollution prevention awards programs. Monthly Pollution Prevention tips/hints were placed on the computerized information system (Inside Energy News) for all Y-12 employees. Topics included affirmative procurement, and definitions of P2 techniques. A site affirmative procurement team was coordinated to identify products available from Y-12 stores that were made from or contained recycled material and then disseminated the information to the plant.

Outreach Activities. The P2 program coordinated a booth at the 1994 Environmental Fair sponsored by the Department of Energy (DOE) and the Energy Systems Environmental Restoration and Waste Management organization. Over 50 volunteers from various organizations participated in the booth from Y-12 that educated over 2,000 students from the surrounding community on how to recycle through carnival games and educational literature. Additional outreach activities included presentations at local schools to increase P2 awareness. Members of the P2 Program also participated in the Professional Awareness and Appreciation Program with Alabama Agricultural and Mechanical University through a presentation at the University. The seminar presented described the various aspects of P2 and

specifically the Program at Y-12. Additional presentations were made at various P2 conference such as the 10th Annual DOE Model Conference Waste Management and Environmental Restoration.

Incentive Programs. In an effort to recognize accomplishments, nominations were made for the DOE-ORO Award of Excellence, Environmental Protection Agency Model Facility Program, DOE Waste Minimization and the Martin Marietta Energy Systems Chairman's Awards and the White House Closing the Circle Award for Source Reduction.

Program Infrastructure. Each organization has designated a Pollution Prevention Advocate to serve as a consistent technical and programmatic contact. The P2 Council met every month on various Pollution Prevention topics to help promote pollution prevention activities within their organization. P2 assessments were completed by the line organizations, these assessments were based on the P2 Program work breakdown structure and provides for the demonstration of elements for an effective P2 Program. The P2 data tracking system was selected to be the model tracking system for the other Oak Ridge Reservation's P2 projects. The database included over 130 projects for CY 1993 and 1994. The P2 program plan was revised during CY 1994 and a site P2 procedure was also issued.

V. Site-Wide WMIN Accomplishments (cont.)

Table 3.0 Site-Wide Recycling Activities

Paper Products		
Office paper	267	mt
Corrugated cardboard	115	mt
Phone books	0	mt
Newspaper	0	mt
Aluminum cans	11.7	mt
Glass	0	mt
Plastic	0	mt
Styrofoam	0	mt
Scrap metals		
Stainless steel	20.9	mt
Copper	0	mt
Iron	0	mt
Aluminum	0	mt
Lead	72.5	mt
Zinc	0	mt
Other: (see discussion below)	0	mt
Precious metals		
Silver	3.49	mt
Gold	0	mt
Platinum	0	mt
Other: (see discussion below)	0	mt
Toner cartiridges	1.56	mt
Batteries	0	mt
Engine oils	18.6	mt
Tires	0.454	mt
Food waste	0	mt
Concrete	0	mt
Wood (chips, compost)	47.2	mt
Other: (see discussion below)	54.5	mt

1200 gallons of transformer oil was reclaimed in CY 1994.

2140 gallons of #2 diesel fuel was sent to the Toxic Substance Control Act (TSCA) Incinerator to be used as start-up fuel.

Swap Shop - A total of 78 Swaps occurred within Y-12 at a cost savings of \$80,707; Incoming 137 Swaps (\$157,897); Outgoing 74 Swaps (\$64,085).

Styrofoam packaging material was collected and reused in packaging of plant shipments.

VI. Return on Investments Accomplishments

Waste/Pollutant Quantity Reduction:

Prevented Waste: (Type and amount)

Amount/Year:

Air Emission-

0 mt/1994

Implementing CSO: DP

Activity Identification Method: T05

source reduction activity: W52
OR recycling activity:

Serial Number:

Status:

-Chlorofluorocarbon (CFC) and Halon Replacement Program for Stratospheric Ozone Protection - The Oak Ridge Y-12 Plant was the first DOE DP facility to develop a long-range Stratospheric Ozone Protection Plan to minimize Plant emissions of Class I and II ozone-depleting substances (ODS), maximize the use of ozone-friendly alternatives, and achieve cost-effective compliance with the EPA's Clean Air Act. The Y-12 Plant was also the first DOE-DP facility to request line-item funding to retrofit or replace all air conditioning and refrigeration equipment for compliance with the Clean Air Act. Preliminary calculations on this project indicate an annual savings of approximately 2,658,000 kilowatt-hours which amounts to approximately \$125,500 per year in FY 93-94 dollars. Engineering design was started in 1994 to replace the Halon systems within the plant, and several obsolete systems were shut-down. A conservation and leak detection program was in-place, and the Plant's 1994 CFC emissions were reduced by more than 68% from the 1992 levels due to these efforts. In addition, Y-12 implemented an innovative alternative solvents and cleaning technologies program, which as replaced vapor degreasers with ultrasonic cleaning using aqueous detergents. The program found several replacements for chlorinated solvents used in hand-wiping or specialty operations.

Comments:

Included above.

VI. Return on Investments Accomplishments

Waste/Pollutant Quantity Reduction:

Prevented Waste: (Type and amount)

Amount/Year:

Mixed-LLW-Liquid

0.053 m3/1994

Implementing CSO: DP

Activity Identification Method: T05

source reduction activity: W52
OR recycling activity:

Serial Number:

Status:

Urine Analysis on Glow Discharge Mass Spec Instrument - This new piece of equipment does not require photographic plates and developing solutions which eliminates 67% of the corrosive waste generated by the process. The new instrument takes about 50% as much time to run a sample as the old method does. A cost savings of \$27 per sample is realized by the elimination of the photographic plate needed to analyze the sample by the old technique.

Comments:

included above.

VI. Return on Investments Accomplishments

Waste/Pollutant Quantity Reduction:

Prevented Waste: (Type and amount)

Amount/Year:

Mixed-LLW-Liquid

0.092 m3/1994

Implementing CSO: DP

Activity Identification Method: T05

source reduction activity: W52
OR recycling activity:

Serial Number:

Status:

Chlorofluorocarbon (CFC) Containment Units - CFC containment units were procured for 34 existing chillers. These units significantly reduced the release of CFCs to the atmosphere and also conserve expensive refrigerant.

Comments:

included above.

VI. Return on Investments Accomplishments

Waste/Pollutant Quantity Reduction:

Prevented Waste: (Type and amount)

Amount/Year:

Mixed-LLW-Liquid

4.13 m3/1994

Implementing CSO: DP

Activity Identification Method: T05

source reduction activity:

OR recycling activity: R40

Serial Number:

Status:

Inductively Coupled Plasma (ICP) Acid Recycling - By recycling the acid used for cleaning ICP glassware, it is estimated that a reduction of waste with an associated cost savings of approximately \$82,000 can be realized. Previously acid used for cleaning/leaching glassware was discarded after one use. There is an additional annual savings of \$9,600 for HNO3 and HCl. Lastly, a savings difficult to quantify are the LMES costs saved procuring supplies, mixing acid solutions, and disposing of wastes.

Comments:

included above.

VI. Return on Investments Accomplishments

Waste/Pollutant Quantity Reduction:

Prevented Waste: (Type and amount)

Amount/Year:

Mixed-LLW-Liquid

0.757 m3/1994

Implementing CSO: DP

Activity Identification Method: T05

source reduction activity: W52
OR recycling activity:

Serial Number:

Status:

Centrifuge Replacement - This project replaces the existing hydraulically driven centrifuges with electrically driven units. Raffinate from primary extraction contains aluminum nitrate which is added to facilitate extraction of uranium. Before, the raffinate is disposed of as biosludge, the aluminum nitrate is removed from the waste and reused instead of preparing additional aluminum nitrate. In addition, the electrically driven centrifuges eliminates the disposal of approximately 200 gallons/year of waste hydraulic oil.

Comments:

included above.

VI. Return on Investments Accomplishments

Waste/Pollutant Quantity Reduction:

Prevented Waste: (Type and amount)

Amount/Year:

Mixed-LLW-Liquid

1.42 m3/1994

Implementing CSO: DP

Activity Identification Method: T05

source reduction activity: W49
OR recycling activity:

Serial Number:

Status:

Elimination of Kathene without Chromates - Removed all Chromated Kathene and replaced with Kathene without Chromates in chilling system that was designed to keep humidity level down. Kathene were flushed and refilled with new Kathene. This was done several times to get the chromates down to acceptable level. Chromates were originally introduced to the system as part of the rust inhibitor. Project reduced both a RCRA liquid and a RCRA solid waste.

Comments:

Included above.

VI. Return on Investments Accomplishments

Waste/Pollutant Quantity Reduction:

Prevented Waste: (Type and amount)

Amount/Year:

Mixed-LLW-Liquid

227 m3/1994

Implementing CSO: EM

Activity Identification Method: T05

source reduction activity: W58
OR recycling activity:

Serial Number:

Status:

Adhoc Mods/BDN Modification - Modifications to the West End Treatment Facility process and the BDN process were implemented as a means of reducing the amount of mixed waste treatment sludges generated and as a means of improving the water quality of the discharged effluent. Two process changes have been made. The first being a change in the BDN Treatment System. In the past acetic acid neutralized with lime was used as a biological feed source in the BDN reactors. Through laboratory testing, it was found that the bacteria were being overfed. The second change is referred to as the ad hoc modification. This modification removes the heavy metals up front in the process before introducing the waste waters to the BDN reactors. Results include significantly reducing the toxicity of the effluent, reducing the level of contaminants in the discharge, and reducing the quantity of treatment chemical required in the final effluent polishing step. The toxicity of the effluent has been decreased from 1% to 15%. Toxicity In addition, because of a cleaner influent being received into the effluent polishing system, reduced quantities of raw treatment chemicals such as sodium hydroxide, ferric sulfate, and sulfuric acid are required.

Comments:

included above.

VI. Return on Investments Accomplishments

Waste/Pollutant Quantity Reduction:

Prevented Waste: (Type and amount)

Amount/Year:

Mixed-LLW-Solid

1.53 m3/1994

Implementing CSO: DP

Activity Identification Method: T05

source reduction activity: W49

OR recycling activity:

Serial Number:

Status:

Elimination of Anisole from foam production - The foam operation previously involved the use of a foam "gun" which was flushed after every foam "shot" in order to keep the lines from clogging up. The only solvent which was acceptable was Anisole which was substituted with DuPont DBE which eliminated a RCRA Solid Waste stream, and affected the air permit as well.

Comments:

included above.

VI. Return on Investments Accomplishments

Waste/Pollutant Quantity Reduction:

Prevented Waste: (Type and amount)

Amount/Year:

Mixed-LLW-Solid

163 m3/1994

Implementing CSO: DP

Activity Identification Method: T05

source reduction activity: W42
OR recycling activity:

Serial Number:

Status:

Elimination of Kathene without Chromates - Removed all chromated KAthene and replaced with Kathene without chromates in a chilling system designed to keep down humidity levels. Kathenes were flushed and refilled with new Kathene. This was done several times to get the Chromates down to an acceptable level. Chromates were originally introduced to the system as part of the rust inhibitor. Project reduced both a RCRA liquid and RCRA solid waste.

Comments:

Included above.

VI. Return on Investments Accomplishments

Waste/Pollutant Quantity Reduction:

Prevented Waste: (Type and amount)	Amount/Year:
Sanitary-Process Wastewater	5300 m3/1994
Implementing CSO: DP	

Activity Identification Method: T05	source reduction activity: W52
	OR recycling activity:

Serial Number:

Status:

Cooling Tower Ozone Generator - In 1993 the installation of the Ozone Generator was completed, and operated in 1994 at essentially "zero discharge" into East For Popular Creek. System blowdowns of chlorinated water into the creek have been effectively eliminated, and only one blowdown was required to remove the calcium deposits which had fallen-off the slats and into the basin. The Ozone Generator has eliminated the procurement and use of all chemicals used to treat the cooling tower water, and chemical discharges into the creek have been eliminated for all practical purposes. Scale formation on condenser tubes and on the cooling tower itself have been eliminated, and energy efficiently has been increased. The Ozone Generator has provided more effective control of bacteria, biofouling, carcinogenic compounds, and corrosion control than the conventional treatment systems. Chemical Savings: \$8,5000/year; Water Savings: 1,400,000 gallons/year; Estimated electrical energy savings: = +/- 10% (for chillers in adjacent chiller building). Facility was not metered prior to project for actual electrical energy usage.

Comments:
included above.

VI. Return on Investments Accomplishments

Waste/Pollutant Quantity Reduction:

Prevented Waste: (Type and amount)

Amount/Year:

Sanitary-Solid

0 mt/1994

Implementing CSO: DP

Activity Identification Method: T05

source reduction activity:

OR recycling activity: R99

Serial Number:

Status:

Rechargeable Alkaline Batteries - Ray-O-Vac Renewal System is being used in various areas of the plant to reduce the number of batteries disposed of in the plant. This has been a voluntary practice among various divisions in the plant. Ray-O-Vac Renewal batteries and recharger are now available on the AVID Supply.

Comments:

included above.

VI. Return on Investments Accomplishments

Waste/Pollutant Quantity Reduction:

Prevented Waste: (Type and amount)

Amount/Year:

Sanitary-Solid

7.45 m3/1994

Implementing CSO: EM

Activity Identification Method: T05

source reduction activity:

OR recycling activity: R99

Serial Number:

Status:

Reusable Carboys - When waste in reusable carboys is emptied at the West Tank Farm, the carboys are triple rinsed and all tags and labels removed. The empty carboys are stored in a designated area until Waste Transportation and Landfill operations returns them to the original generators.

Comments:

included above.

VII. CSO Specific Information

CSO: DP

Summary Statement of Operational Status and its affect on Waste Generation.

Significant decreases in weapons production related activities continues to occur. The mission of the facility has changed from weapons production and assembly oriented programs to disassembly, special materials storage and management, technology transfer and work for others, and stockpile capability evaluation. In addition, the largest operational impact has been the current stand-down situation at Y-12 that started in the fall of 1994 has required resources to be diverted from pollution prevention activities to activities directly related to the stand down.

Table 4.0 CSO: DP Waste Generation.

Waste Type		Routine	Non Routine	Total	Process Wastewaters
High Level Waste	(L) (S)	* m3 * m3	* m3 * m3	0 m3 0 m3	* m3
Transuranic Waste (TRU)	(L) (S)	* m3 * m3	* m3 * m3	0 m3 0 m3	* m3
Mixed-TRU	(L) (S)	* m3 * m3	* m3 * m3	0 m3 0 m3	* m3
Low-Level Waste (LLW)	(L) (S)	4.45 m3 1880 m3	0 m3 0 m3	4.45 m3 1880 m3	820 m3
Mixed-LLW	(L) (S)	84.0 m3 65.9 m3	3.45 m3 2.18 m3	87.5 m3 68.1 m3	1400 m3
RCRA Regulated		* mt	* mt	0 mt	* m3
State Regulated		* mt	* mt	0 mt	* m3
TSCA Regulated		* mt	* mt	0 mt	* m3
Mixed-TSCA		0 mt	16.2 mt	16.2 mt	0 m3

VII. CSO Specific Information

CSO: EM

Summary Statement of Operational Status and its affect on Waste Generation.

EM activities at the Y-12 plant include waste transportation, storage and disposal facilities and environmental restoration/decontamination and decommissioning programs. The largest operational impact has been the current stand-down situation at Y-12 that started in the fall of 1994. Waste management activities, and resulting waste has not remained constant. Additionally, approximately 4 million gallons of waste water are being treated at the Liquid Storage Facility including approximately 2.5 million gallons of waste water from K-25 that has been treated at Y-12 starting in January of 1994.

Table 4.1 CSO: EM Waste Generation.

Waste Type		Routine	Non Routine	Total	Process Wastewaters
High Level Waste	(L)	* m3	* m3	0 m3	
	(S)	* m3	* m3	0 m3	* m3
Transuranic Waste (TRU)	(L)	* m3	* m3	0 m3	
	(S)	* m3	* m3	0 m3	* m3
Mixed-TRU	(L)	* m3	* m3	0 m3	
	(S)	* m3	* m3	0 m3	* m3
Low-Level Waste (LLW)	(L)	0 m3	0 m3	0 m3	
	(S)	182 m3	36.8 m3	219 m3	14.8 m3
Mixed-LLW	(L)	67.6 m3	1.02 m3	68.6 m3	
	(S)	23.9 m3	13.0 m3	36.9 m3	9510 m3
RCRA Regulated		* mt	* mt	0 mt	* m3
State Regulated		* mt	* mt	0 mt	* m3
TSCA Regulated		* mt	* mt	0 mt	* m3
Mixed-TSCA		0 mt	9.7 mt	9.7 mt	0 m3

**Summary of Information from Site Waste Minimization
and Pollution Prevention (WMIN/PP) Awareness Plan**

The following information is based on the May 1994 update to the Site-wide Waste Minimization and Pollution Prevention Awareness Plan. All information has been taken directly from the plan (the appropriate sections are listed in brackets [] refer to the Plan Suggested Outline contained in guidance issued by Deputy Secretary White on March 28, 1994).

I. Site-wide Quantitative Goals for Newly Generated Wastes*
[Section IV. Goals]

Waste Type	1993	1994	1995	1996	1997	1998	1999	2000
HLW	0 m3	0 m3	0 m3	0 m3	0 m3	0 m3	0 m3	0 m3
LLW	3650 m3	1550 m3	0 %	10 %	15 %	20 %	25 %	25 %
TRU	0 m3	0 m3	0 m3	0 m3	0 m3	0 m3	0 m3	0 m3
Mixed-TRU	0 m3	0 m3	0 m3	0 m3	0 m3	0 m3	0 m3	0 m3
Mixed-LLW	509 m3	248 m3	0 %	20 %	30 %	40 %	50 %	50 %
Mixed-TSCA	31 m3	5 m3	0 %	20 %	30 %	40 %	50 %	50 %
RCRA Reg **	0 mt	0 mt	0 mt	0 mt	0 mt	0 mt	0 mt	0 mt
State Reg **	0 mt	0 mt	0 mt	0 mt	0 mt	0 mt	0 mt	0 mt
TSCA Reg **	0 mt	0 mt	0 mt	0 mt	0 mt	0 mt	0 mt	0 mt
Sanitary **	17900 mt	-3500.000 mt	0 %	4 %	6 %	8 %	10 %	10 %

**II. Narrative on Qualitative Goals for Restoration and D&D
Activities.** [Section IV. Goals - see Table 1]

The Environmental Restoration (ER) Waste Minimization and Pollution Prevention Program continues to develop. Part of the planned development is to identify discrete goals, related to specific ER activities. At this time there are two broad goals of the ER program; decrease the amount of environmental media handled as Investigation Derived Waste, and reduce the volume of disposable Personal Protective Equipment disposed as solid waste.

*/ Newly Generated Waste = Routine, ongoing production operations and research and development.

**/ Separate source reduction and recycling goals have been included.

**Summary of Information from Site Waste Minimization
and Pollution Prevention (WMIN/PP) Awareness Plan**

III. Pollution Prevention Opportunity Assessment Goals:
[Section IV. Goals - see Table 1]

Completed as of the end of CY 1994: 1
 Number planned for CY 1995: 6
 Number planned for CY 1996: TBD
 Number planned for CY 1997: TBD
 Number planned for CY 1998: TBD
 Number planned for CY 1999: TBD
 Number planned for CY 2000: TBD

IV. WMin/PP Program Budget for Site: (by Fiscal Year)
[Section V. - WMin/PP Activities and Resource Requirements]

A. Total WMIN/PP budget:	TOTAL OPERATING	TOTAL CAPITAL	TOTAL SITE
1995 - \$	3821000	\$ 1404000	\$ 5231000
1996 - \$	2700000	\$ 0	\$ 2700000
1997 - \$	2700000	\$ 0	\$ 2700000
1998 - \$	2700000	\$ 0	\$ 2700000
1999 - \$	2700000	\$ 0	\$ 2700000
2000 - \$	2700000	\$ 0	\$ 2700000
2001 - \$	2700000	\$ 0	\$ 2700000

[Section V. - see Table 2, item 5]

B. Total Budget for PPOAs:	1995 - \$ 260000	1999 - \$ TBD
	1996 - \$ TBD	2000 - \$ TBD
	1997 - \$ TBD	2001 - \$ TBD
	1998 - \$ TBD	

Site-wide Resources (\$) Needed for Key Programmatic Elements:

C. Implement Source Reduction Opportunities for:

FY 1995	1996	1997	1998	1999	2000	2001
Hazar \$ TBD	TBD	TBD	TBD	TBD	TBD	TBD
Radio \$ TBD	TBD	TBD	TBD	TBD	TBD	TBD
Mixed \$ TBD	TBD	TBD	TBD	TBD	TBD	TBD

D. Implement Recycling Opportunities for:

FY 1995	1996	1997	1998	1999	2000	2001
Hazar \$ TBD	TBD	TBD	TBD	TBD	TBD	TBD
Radio \$ TBD	TBD	TBD	TBD	TBD	TBD	TBD
Mixed \$ TBD	TBD	TBD	TBD	TBD	TBD	TBD

**E. Implement Source Reduction and Recycling Opportunities
for Sanitary Wastestreams**

FY 1995	1996	1997	1998	1999	2000	2001
\$ 800000	1000000	1000000	1000000	1000000	1000000	1000000

Summary of Information from Site Waste Minimization
and Pollution Prevention (WMIN/PP) Awareness Plan

V. Narrative on Overall Program Status/Evaluation:

[Section VII. Program Status - see Table 2, item 9]

See Appendix

VI. Optional Reduction Goals for Process Wastewater:

[Section IV. Goals - see Table 1]

Waste Type	1993	1994	1995	1996	1997	1998	1999	2000
Radioactive	1060 m3	835 m3	5 %	10 %	15 %	20 %	25 %	0 %
Mixed	11100 m3	10900 m3	10 %	20 %	30 %	40 %	50 %	0 %
Hazardous	0 m3	0 m3	0 m3	0 m3	0 m3	0 m3	0 m3	0 m3
Sanitary	146000 m3	231000 m3	2 %	4 %	6 %	8 %	10 %	0 %

Appendix (optional)

The performance assessment presented are based on the Department of Energy Headquarters (DOE-HQ) P2 Program Work Breakdown Structure. This set of performance measure criteria were used for evaluation of line organization implementation of P2 at the Y-12 Plant. A rating system is used, with implementation and status evaluated on a scale of 1 to 10, with a maximum possible score of 100 for all program elements. Element 6, regarding implementation projects for P2 is weighted 20 percent, while all other elements are weighted 10 percent each. Assessments were completed by the P2 advocate for the major waste generating organizations at Y-12.

- 1) Organization/Infrastructure:
- 2) Program Development
- 3) Employee Involvement
- 4) Tracking
- 5) Reporting
- 6) Implement Source Reduction and Recycling for Waste Streams, Emissions, & Discharges
- 7) Technical Progress
- 8) Information and Technology Exchange
- 9) Program Evaluation

SUMMARY FOR PERIOD JANUARY - JUNE 1994

	DP AVERAGE	EM AVERAGE
1)	10	10
2)	7	7
3)	8	6
4)	8	10
5)	9	10
6)	17	11
7)	4	5
8)	10	10
9)	2	0
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TOT	75	69

SUMMARY FOR PERIOD JULY - DECEMBER 1994

	DP AVERAGE	EM AVERAGE	WM
1)	9	7	
2)	6	6	
3)	7	6	
4)	8	10	
5)	8	6	
6)	19	17	
7)	6	5	
8)	8	10	
9)	5	0	
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TOT	76	67	