

Y-12 and emerging environmental regulations in 1985

In Y-12's early days of its first mission, to separate Uranium 235 from natural uranium, the peak population hit 22,482 on August 21, 1945. It had been over 20,000 since December, 1944. It had been over 22,000 since June, 1945. By September, 1945, the population was again at 20,000 and by November, 1945, it was under 15,000.

During this same time the population of Oak Ridge had climbed to 75,000 and by November, 1945, was dropping rapidly back and would eventually settle out at roughly 30,000. The population of the city would remain fairly constant over the ensuing years.

By June, 1947, Y-12's workforce was down to only 2,440. Starting in 1948, however, the new mission of machining uranium metal started the upward growth in population and the COLEX (column exchange) process that operated from 1955 to 1963, increased the population even more.

Y-12's population would fluctuate somewhat over the years, but would generally continue to grow until the mid 1980's when it peaked at 9,545 in 1985. That number did include 1,100 Oak Ridge National Laboratory employees working at Y-12. So, over 8,400 workers were employed at Y-12 producing secondaries for nuclear weapons to help win the Cold War.

At the same time that Y-12 was working around the clock to meet the production demands the major shift in thinking regarding environmental issues began to demand attention as well. A *Y-12 Plant Long-range Environmental Management Plan* was published in July, 1985, by Martin Marietta Energy Systems, Inc., the managing and operating contractor.

This plan spelled out in detail for the first time, the full extent of the broad based environmental issues facing the site. It contained the pollution control plans for air, water and solid waste. There was also a section on remedial actions to be taken and a section on the impacts to Y-12 of putting these controls and management actions in place.

There was a separate section on the mercury-contaminated sites. This section included Y-12's mercury management program plans, the reduction of mercury in effluents, the decommissioning of the Lithium Isotope Separation Facilities, and the plans for the assessment and control of mercury.

One of the environmental acts being implemented was the Clean Air Act of 1970, which placed the Environmental Protection Agency in charge of monitoring and improving the quality of the air. The 1990 revision of this act went even further and targeted acid rain, required the reduction of sulfur dioxide and nitrogen oxides by half, established limits on ozone and mandated the phasing out of chlorofluorocarbons and other ozone depleting chemicals reducing the protective ozone layer in the earth's upper atmosphere.

Another was the Clean Water Act of 1972 which established the National Pollutant Discharge Elimination System (NPDES) permit program. In 1985, Y-12 was building eight new wastewater treatment facilities to meet the NPDES discharge limits as defined in the permit issued in May, 1985. Mercury was identified as a concern and that "discharge limitations on mercury have been set in a manner consistent with those for other pollutants."

One result of the implementation of the Clean Water Act was the initiation of the practice of adding raw water (water from the Clinch River) to the headwaters of the East Fork of Poplar Creek, located just to the south of Building 9204-1 about midway of Y-12. The initial flow augmentation was five million gallons per day. It has been reduced to three million gallons per day and continues even today.

Yet another of the environmental acts was the Resource Conservation and Recovery Act (RCRA) of 1976 and its amendments of 1978, 1980 and 1984, at the time. It was amended again in 1988 and 1996. But in 1985, the 1984 amendments were and still are the most substantial additions to the program. These amendments were called the "Hazardous and Solid Waste Amendments" and they expanded the

coverage of RCRA and its requirements to include hazardous industrial wastes. The impact on Y-12 was indeed substantial.

The Y-12 Long-range Environmental Management Plan states on page 1-13, that, "...the Y-12 Plant needs many RCRA facilities. Projects that will provide treatment, storage, and disposal facilities for hazardous wastes are planned, and facilities will be shared by multiple sites whenever feasible. In addition, many administrative programs are being developed and implemented to bring existing installations into full RCRA Part B permit applications. These applications, which are being prepared on an expedited schedule, will be submitted to the Environmental Protection Agency."

As you can see, the impact on Y-12 was no small thing. According to the above quoted report, it caused Y-12 to alter disposal practices, especially with waste oils. The report stated that underground piping and storage facility designs would need to be changed as well.

The report went on to state that the major uncertainty with regard to RCRA compliance was the regulation of hazardous, radioactive wastes, or mixed wastes as it was sometimes known. At issue was the balance between radiation or criticality safety requirements and RCRA disposal requirements. The Department of Energy retained the right to trump RCRA requirements if they interfered with criticality safety and to recommend to EPA the necessary radiation protection.

Finally, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) was identified in the report as the most uncertain of the environmental protection strategies. It stated, "The major uncertainty is the magnitude of the problem and the solution. Sufficient data pertaining to the groundwater, surface water, surface-water sediments, and soils contamination are currently not available to determine all the remedial action needs, much less the scope of such actions."

The report continued, "The immediate plans thus call for data collection and evaluation, followed by remedial action alternative studies for areas where problems are found to exist and ultimately, remedial actions themselves." So, Y-12 folks were facing uncertain situations whereby the regulations being produced that impacted them were not yet fully understood and the eventual impacts unknown.

Finally, the report states, "The final decision on the need for the Environmental Impact Statement will be made at DOE Headquarters during 1985" (the report was written in July, 1985). The CERCLA requirements, while still well into the future at the time, were seen as being significant changes.

This report documented the beginning of major changes at Y-12 that were wide ranging and touched every aspect of work at the site. We will continue to look into the history of environmental changes over the years in coming articles. If you have insights into the changes and requirements, I would appreciate hearing from you. Many of you lived through these changes and I am sure you have retained knowledge of what actually took place. Send any of your personal memories of environmental changes at Y-12 to smithdr@y12.doe.gov or call me at 865-576-7781.