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Hanford Recycling

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EXECUTIVE SUMMARY

This paper is a study of the past and present recycling efforts on the Hanford site and options for future improvements in the recycling program. Until 1996, recycling goals were voluntarily set by the waste generators: this year, DOE has imposed goals for all its sites to accomplish by 1999. Hanford is presently meeting the voluntary site goals, but may not be able to meet all the new DOE goals without changes to the program.

Most of these new DOE goals are recycling goals:

- Reduce the generation of radioactive (low-level) waste from routine operations 50 percent through source reduction and recycling.
- Reduce the generation of low-level mixed waste from routine operations 50 percent through source reduction and recycling.
- Reduce the generation of hazardous waste from routine operations 50 percent through source reduction and recycling.
- Recycle 33 percent of the sanitary waste from all operations.
- Increase affirmative procurement of EPA-designated recycled items to 100 percent.

The Hanford recycling program has made great strides-there has been a 98 percent increase in the amount of paper recycled since its inception in 1990. Hanford recycles paper, chemicals cardboard, tires, oil, batteries, rags, lead weights, fluorescent tubes, aerosol products, concrete, office furniture, computer software, drums, toner cartridges, and scrap metal. Many other items are recycled or reused by individual groups on a one time basis without a formal contract. Several contracts are closed-loop contracts which involve all parts of the recycle loop. Considerable savings are generated from recycling, and much more is possible with increased attention and improvements to this program.

General methods for improving the recycling program to ensure that the new goals can be met are:

- Contract and financial changes
- Tracking database and methods improvements
- Expanded recycling efforts.

Specifically, the Hanford recycling program would be improved by:

- Establishing one overall DOE recycling contract at the Hanford site and a central group to control the contract.
- Using a BOA or MTS contract as a way to get proceeds from recycling back to site facilities to provide incentives for recycling.

- Upgrading tracking mechanisms to track and recycle construction waste which is presently buried in onsite pits.

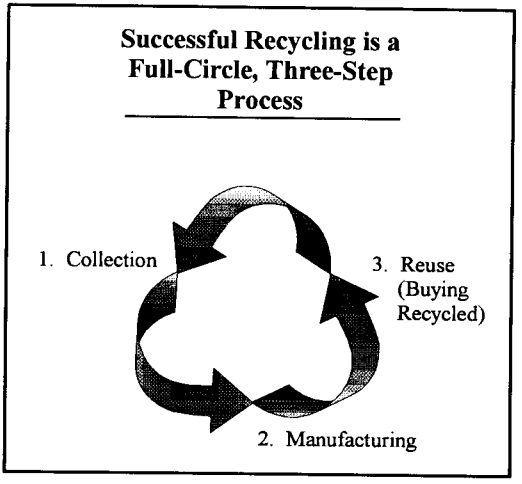
- Establishing contract performance measures which hold each project accountable for specific waste reduction goals.

- Recycling and reusing any material or equipment possible as buildings are dismantled.

Recycling

Recycling is using, reusing, or reclaiming materials; on the Hanford site, these are materials that would otherwise be considered hazardous, sanitary, or radioactive wastes. All types of waste are candidates for recycling.

Figure 1 Hanford Recycling



Recycling involves three continuous steps as shown in Figure 1:

1. Collecting waste
2. Manufacturing products from the recycled waste
3. Buying the recycled products

In some ways recycling is easier than source reduction since it involves collection at the end of a waste stream, not prevention of the waste at the source which usually requires more planning and analysis. However, recycling does not work unless all parts of the process are

in place--if recycled products, ones made entirely or partially from material recovered from any waste stream, are not purchased, the cycle is broken. Therefore, affirmative procurement, buying recycled products, must be considered part of recycling. Cooperation among divergent groups on site controlling different aspects of the recycle process is imperative to ensure that all parts of the cycle are in place.

Recycling significantly reduces the amounts of all types of waste disposed and saves considerable money. In 1993, Hanford recycled 14,589 metric tons of waste generated and 14,736.8 metric tons in 1994. Last year, reusing furniture saved $100,000; recycling coolant saved $121,400; and recycling nitric acid saved $500,000. In 1996, eleven 45 foot trailers were excessed for redeployment to save almost $250,000. With increased attention, the recycling program could be even more productive.

1993 Baseline

The year 1993 is the baseline year for all DOE goals. According to the DOE *Annual Report on Waste Generation and Waste Minimization Progress 1993,* Hanford is one of the 55 DOE sites that report as a waste generator as required by DOE Order 5400.1, *General Environmental Protection Program.* In 1993, these DOE sites generated a total of 311,371 cubic meters of waste - 128,619 radioactive, 9,095 mixed, 53,580 hazardous, 120,077 sanitary. The waste generated by the 55 sites was classified as either routine operations waste (generated as the result of normal operations), cleanup/stabilization waste (generated a single time as a result of environmental restoration and dismantling activities), or sanitary waste (neither hazardous nor radioactive). Seventy-three percent was from cleanup/stabilization activities and 27 percent from routine operations. The sanitary waste was generated mostly by housekeeping and construction activities.

A chart showing Hanford 1993 baselines by waste types numbers and the proposed Hanford source reduction forecasts for 1996 to 2000 (years 1997 to 2000 are subject to change as a result of the new DOE goals for 1999) is in Table 1 in Attachment 1. DOE baselines given in the *Annual Report on Waste Generation and Waste Minimization Progress 1993* (pg 56) for routine waste for the State of Washington, which include PNNL, essentially agree with the Hanford baseline numbers shown in Table 1. However, these 1993 baselines were based on the quantities sent to disposal and do not include the quantities recycled. The amount recycled (14,589 mt) must be added to the baseline 7660 metric tons (mt) of sanitary waste to find the total sanitary waste generated. A more thorough evaluation of the 1993 baseline is needed to determine all the required changes.

Establishing Hanford Site Goals

Affirmative Procurement

Section 6002 of the 1976 Resource Conservation and Recovery Act (RCRA) established the requirement to stimulate private-sector markets for recovered materials through preferential procurement of designated items. Executive Order (EO) 12780, *Federal Agency Recycling and the Council on Federal Recycling and Procurement Policy* established the requirement for

affirmative procurement by all federal agencies. The requirements of EO 12780 were revoked in 1993 and reissued through EO 12873 *Federal Acquisition, Recycling, and Waste Reduction*. Presidential Executive Order 12873 required reducing waste through recycling and the purchase of products with recycled content.

Currently the following five EPA procurement guidelines are binding on federal agencies:

- *Procurement Guideline for Cement and Concrete Containing Fly Ash*, 40 CFR 249.
- *Procurement Guideline for Paper and Paper Products*, 40 CFR 250.
- *Procurement Guideline for Lubricating Oils Containing Re-Refined Oil*, 40 CFR 252.
- *Procurement Guideline for Retread Tires*, 40 CFR Part 253.
- *Procurement Guideline for Building Insulation Products Containing Recovered Materials*, 40 CFR 248.

Hanford and the other DOE sites were working toward a goal of purchasing 50 percent of the 5 EPA-designated recycled products until this year when the Secretary issued the new goals.

Other Site Goals

DOE-HQ WMin Division has always required site waste minimization goals as part of every DOE site's P2 program plan. Hanford established goals in 1991 to reduce State and RCRA, radioactive, and radioactive-mixed waste 2 to 10 percent/year between 1991 and 1995 using 1990 quantities as a baseline.

In 1994 the DOE mandated goals were to reduce the total release of toxic chemicals to the environment and off-site transfers of such chemicals by 50 percent by 1999 and to establish site specific goals to reduce generation of all types of waste and pollutants including hazardous, radioactive, radioactive mixed, and sanitary from site operations.

From 1993 to 1996, Hanford site specific waste reduction goals were established through voluntary bottom-up goal setting procedures where the waste generator goals were compiled into site goals. Performance measures to status progress against the Hanford goals were developed quarterly and annually from progress reports submitted by the waste generators.

WHC also integrated the contracts for all the contractors on site; however, in the past year, PNNL and BHI established separate recycling contracts. See Tables 3 and 4 in Attachment 2 for a breakdown of contracts by contractor.

Hanford Site Goals

EPA is developing several new affirmative procurement guidelines for additional products and conducting pilot programs for implementation strategies. DOE has expanded and will continue to expand their affirmative procurement products list to include new guideline items and requirements as they are issued by the EPA. DOE also provides preference standards for the products and product categories in their Affirmative Procurement Plan. Request for Proposals or bids are worded such that minimum content is desired but, based on availability, lower percentages will be considered.

Sanitary waste data is obtained from ICF KH for routine activities; however, large quantities of sanitary waste from clean-up/stabilization activities are deposited in on-site pits and accurate numbers for the amount of waste are not available. Tracking and reporting of these quantities is needed to accurately determine the percent of sanitary waste recycled.

For 1996, the voluntary site sanitary waste recycling goal for Hanford is 25 percent of the sanitary waste estimated to be produced this year; the goals for 1996 to 2000 are shown in Table 2. However, the goals for years 1997 to 2000 will be changed to agree with the Secretary of Energy's 1999 goals.

DOE sites are now required to use an annual baseline based on the projected sanitary waste for the year. Hanford's projected waste for 1996 is 12,000 metric tons (mt); therefore, the goal for 1996 is to decrease the amount of sanitary waste disposed of as waste by 3,000 mt to 9,000 mt through reuse and recycling. The goals for RCRA and state waste are calculated in the same way; therefore, the 1996 goal is to dispose of no more than 46.3 mt as RCRA waste and 9.6 mt as state waste.

Table 2

Projected Waste Generation and Recycling Goal Forecasts for CY 1996-2000

Waste Type	Forecast 1996	CY 96	CY 97	CY 98	CY 99	CY 2000
RCRA Hazardous Waste (mt)	87.3	47%	47%	44%	44%	44%
State-only Hazardous Waste (mt)	14.5	34%	33%	33%	33%	33%
Sanitary (mt)	1200	25%	25%	25%	25%	25%

What steps are we taking to meet present recycling goals?

Hanford establishes performance measures quarterly based on goals given in Table 1 in Attachment 1 and in Table 2, above. The goals for the years 1997 to 2000 will be changed to agree with the latest DOE requirements.

Pollution Prevention Opportunity Assessment training and technical assistance in conducting the assessments are available through the Site Pollution Prevention office. These assessments provide a systematic process to evaluate the material inputs to a process and outputs to identify opportunities for waste reduction. Funding proposals including return on investments are developed for the opportunities recommended for implementation. Eleven Pollution Prevention Opportunity Assessments have been conducted on the major sources of waste generation or cross-cutting waste streams over the last year.

The site recycling and reuse programs recycled the sanitary waste items listed below.

Hanford Site Recycling Programs in 1995 - Total = 5,071.3 mt (includes chemical reuse)

- Batteries - 21.8
- Cardboard (corrugated only) - 20 mt (includes PNNL)
- Concrete - 249.5 mt
- Engine oil - 51.9 mt
- Lead (free of contamination) - 57 mt
- Metal (ferrous and non-ferrous steel, copper/brass, scrap furniture and appliances) - 215 mt of stainless steel, 57 mt of lead, and 3,574 mt of iron
- Paper (office type, newsprint, phonebooks, magazines) - 632 mt (includes PNNL)
- Plastic - 6.2 mt
- Print toner cartridges - 9.1 mt
- Software - 49 mt
- Tires - 13.0 mt
- Wood (clean) all other wood sent to landfill - 21.8 mt

Hanford Site Reuse Programs in 1995 - Liquids 77,922 liters + Solids 16 mt = Total 94 mt

- Chemicals are redeployed as follows:

  1) Find on site users for surplus chemicals
  2) Conduct bulk chemical sales
  3) Conduct small quantity sales
  4) Innovative redeployment versus disposal

- Envelopes reused

- Eye glasses/hearing aids are collected on site and donated to underdeveloped countries through the Lions Club.

- Moving box reuse - free (used) boxes given out and used boxes returned for reuse

- Office supply reuse program - a list of excess supplies or required supplies electronically listed and distributed.

- Packing peanuts reused

Paper Recycling Program

Since paper is the largest part of government agencies' solid waste stream according to *Greening the Government*, the recycling of paper on this government site offers our best recycling opportunity. The recycling rate for paper in the US increased from 28 percent in 1986 to 40 percent in 1994. Between 1990 and 1994 the recovery rate for office paper almost doubled (19.9 percent to 37.1 percent). Hanford did even better - a 98 percent increase since starting the program in 1990. The growth of paper recycling program at Hanford is illustrated below:

Calendar Year	Metric Tons Recycled
1990	12
1991	136
1992	359
1993	516
1994	630
1995	632

This table shows that the spectacular growth of the paper recycling program slowed considerably after 1994. Unfortunately, more paper is being purchased now--in 1993, 680 mt was purchased; in 1995, the amount of paper purchased had increased to 889 mt; and this year looks about the same as 1995. However, both recycling of cardboard and PNNL paper are now being accounted for separately. But more paper should be recycled if more is purchased, and increased emphasis on this program is required to improve our progress toward DOE goals.

Are we attaining recycling goals?

In 1995, Hanford recycled a total of 5071.3 mt of sanitary waste. Sanitary waste disposed of in 1995 = 30,089 cubic yds = 9994 mt (total weight of all loads taken to landfill). Total sanitary waste = 15,065.3 mt.

The following calculation for percent recycled were done according to DOE example on page 9 of this report:

$$\frac{5071.3}{5071.3 + 9994 \text{ (total sanitary waste)}} \times 100 = 34\%$$

Hanford is well above the site 25 percent recycling goals for 1995. However, site goals will be changed so that we will be sure to meet the 33 percent DOE goals by 1999. Present

trends show downward progression in recycling since 1993, and that can be reversed with more effort directed to recycling.

For the first 6 months in 1996, the total sanitary waste recycled by WHC Materials Management = 1268.9 mt. This total for 1996 looks much lower than it should; however, these are not the final totals, and it is difficult to trend recycling because this activity is not constant throughout the year. Hanford site does have a variety of other recycling programs in other contractor groups to help achieve goals. Present contracts for the Hanford recycle programs are shown in the Tables 3 and 4 in Attachment 2.

What are other sites doing in present recycling programs?

SRS SRS is renegotiating recycling contract at present. Their new contract for office waste will make proceeds of recycling available to site recreation facilities and put back money into waste minimization budget instead of general plant overhead. They will use part of their recycling money for employee motivation and morale.

The SRS "Go for the Green" program focuses on cleaning areas by recycling, redeploying, and recovering as many materials as possible. This program is led by housekeeping and an asset management specialist and generated over $1.05 M in cost savings. It also reduced waste disposal significantly--over 22.5 tons of scrap metal, paper, and aluminum cans were recycled as part of this program.

The "Green is Clean" program separates clean nonhazardous waste stored in a radiation buffer area and separates clean waste from radioactive or hazardous waste at the point of generation. The program allows this clean waste to be placed into green containers for free release without survey. These practices have been instituted at two facilities, and when they are instituted site wide, SRS expects a yearly savings of $1M.

As part of the site's Beneficial Reuse Program, SRS is reusing old stainless steel materials to manufacture 55-gallon and 85-gallon drums. These drums are being manufactured at Manufacturing Sciences Corporation, a WSRS subcontractor in Oak Ridge, by melting down portions of radioactively contaminated heat exchangers. Carolina Metals, Inc, supplied sixteen 100-cubic-foot boxes previously as part of the demonstration phase where 100 tons of contaminated SRS metal will be recycled. Hanford is expected to receive and test containers as part of this demonstration.

SRS has also established performance-based incentives for pollution prevention and low-level waste reduction. Pollution prevention incentive language is incorporated in all contract documents giving the contractors a share of the money if they reach specific waste reduction numbers.

INEL Office waste recycle program - 80 percent of the recycling profits go to support the recycle program. The rate paid for recycled items is based on magazine published rates of fair market value (FMV) for the item. As an incentive for facilities, there is a monthly contest where the group that recycles the most has 5 to 10 names drawn to win prizes like a night at movies including movie, tickets, and food.

INEL also has the lead in DOE complex-wide hazardous waste contract. This master task subcontract (MTS) system gives the residuals, after the recycling group withdraws its administration expenses, back to the waste generators. Hanford site does not participate in this contract.

ORNL Oak Ridge has their white paper picked up by a nonprofit group; this group use the proceeds from recycling the paper to offset the cost of their charitable programs. Oak Ridge also pays to have their coal ash recycled into cement.

Y-12 has a volunteer aluminum recycling program. The recycler provides collection wagons for the aluminum cans collected on site. The proceeds from the recycling go to an employee committee; the committee determines what to do with the returns. In the past, money has gone to various community projects, employees in need, and local charities like the Ronald McDonald House. The recycling group estimates that 98 percent of the employee cans are recycled as a result of this program.

What do others do that Hanford doesn't?

- Incentives for recycling by returning money to employee programs
- Contest as reward/incentive for recycling
- DOE complex-wide recycling contract participation
- Contract performance measures and "Go for Green" program
- Free release

New DOE Programs

Recycle 2000 - Scrap Metal Recycling Program to be implemented by the year 2000

The Office of Environmental Management annually disposes of more than 40,000 cubic meters of low-level radioactive waste and radioactively contaminated scrap metal, and this amount is expected to increase as more DOE facilities are decommissioned. At the present time, most of this waste is buried. To minimize the volume of waste requiring disposal, DOE has established a recycling policy for radioactively contaminated carbon steel. By the year 2000, this program requires that 50 percent of all DOE sites' low-level carbon steel waste will be used to fabricate containers for low-level waste disposal. The first option of this program is free release of decontaminated carbon steel. If free release is not possible, then the low-level radioactive waste is required to be fabricated into one time use packages for disposal of other low-level wastes.

New containers using the low-level radioactive carbon steel have been designed to minimize void space and maximize transportation efficiencies. They are certified to be used for compact soil disposal, as an overpack for six 55-gallon drums, and for bulk wastes that require containment prior to disposal. These containers can be constructed from nonproprietary parts and can incorporate changes required by site-specific waste acceptance criteria. Idaho and Oak Ridge are presently manufacturing containers.

Since, in the early stages, the cost of recycling contaminated metal may exceed the cost of disposal, DOE sites are being encouraged to work together to achieve economies of scale. One vendor, Envirocare in Utah, has indicated it will take waste materials packaged in radioactive contaminated metal containers for disposal. Hanford waste acceptance criteria has not yet been changed to accommodate requirements of Recycle 2000. However, the changes are planned at DOE direction and when more specific requirements of the program are known.

New DOE Goals for 1999

On May 3, 1996, Secretary O'Leary announced the following new goals for all DOE sites to be accomplished by December 31, 1999:

For Routine Operations:

- Reduce the generation of radioactive (low-level) waste 50 percent through source reduction and recycling.
- Reduce the generation of low-level mixed waste 50 percent through source reduction and recycling.
- Reduce the generation of hazardous waste 50 percent through source reduction and recycling.
- Reduce the generation of sanitary waste 33 percent through source reduction only.
- Reduce total releases and off-site transfers for treatment and disposal of EPCRA 313 toxic chemicals 50 percent.

For All Operations, Including Clean-up/Stabilization Activities:

- Recycle 33 percent of sanitary waste from all operations including cleanup/stabilization activities. The calculations are based on how much sanitary waste is projected to be generated for that year.

  Example calculation from DOE:

  For 1993, recycling amount/(recycling amount + sanitary total) x 100 = 60,730 (includes paper, metals, automotive, other)/60,730 + 135,746 x 100 = 31%

For Affirmative Procurement:

- Increase affirmative procurement of EPA-designated recycled products to 100 percent.

How are we doing in accomplishing these new goals?

Recycling of Sanitary Waste:

The recycling of sanitary waste was 31 percent in 1995, down from 64 percent in 1993. It doesn't appear the DOE goal will be met by 1999 because of the downward trend in recycling since 1993. The 33 percent goal for waste from all operations is, however, achievable with increased emphasis on the recycling program.

Affirmative Procurement:

In 1995, 23 percent of Hanford procurement dollars spent on the 5 tracked categories of the EPA-designated recycled products were for items actually containing the required recycled content. The EPA-designated product list increased to 24 tracked categories in May, 1996, and Attachment 3 provides a current listing of those designated items.

Currently several avenues exist for procurement of materials at Hanford. These include contractual agreements with vendors, purchase requisitions, charge cards, and sub-contractors. Several exceptions from the requirements to buy recycled are afforded by both EPA and DOE that reduce the procurement cost and tracking burdens. They are:

- Products purchased through GSA do not need to be tracked or reported.
- Adequate competition must exist.
- Price, performance, and availability are equal.
- Contractors do not report on items if they buy less than $10,000 worth of that item.

Each Hanford contractor maintains their own affirmative procurement plan (APP) for communicating requirements and goals to employees, identifying products, tracking, and reporting. Where practical, Central Stores makes purchases of large volume items such as paper and paper products for the site. Contractors allowing the use of charge cards (P-Cards) for material purchases include a reference to the DOE APP in their training or instructions to card holders. Contractor must also identify a cost effective mechanism for reporting purchases of affirmative procurement materials. In 1999, the established goal of 100 percent will be achieved by either increasing the purchased quantities or documenting the reason for not purchasing products with recycled content.

Routine Operations:

The routine operations goals are to be accomplished by source reduction and recycling, except for the sanitary waste goal which must be accomplished by source reduction only while the parallel goal for all operations requires recycling 33 percent of the sanitary waste from all operations.

Data trending has shown the following results towards accomplishment of the new goals:

- The goal for radioactive low-level waste will probably be met.

- The goal for low-level mixed waste will not be met, but is achievable with increased emphasis.

- The hazardous waste goal will not be met, but is achievable with increased emphasis.

Hanford is required to meet the Secretary of Energy's 1999 goals including 33 percent sanitary waste recycled in 1999 and 100 percent procurement of recycled goods in 1996, and to participate in the Recycle 2000 program. Meeting these new goals will require increased effort every year and can only be accomplished by increased cooperation among all groups involved in waste production and handling, procurement, and pollution prevention/waste minimization.

Change Recycle Contracts

1. Establish One DOE Site-Wide Recycling Contract for Hanford

At present several contracts are duplicated on this site. PNNL has a multicommodity contract; ICF Kaiser has a contract for rags; WHC also has both these contracts. If there were one DOE recycling contract with major vendors that was tied off to subs (facilities, contractors) set up so that the facilities could keep revenue from recycling after administration costs were removed, facilities would have more incentive to recycle. Procurement costs could be reduced and the contract would yield greater revenues, based on larger volumes.

Option 1 under "Offer Incentives for Recycling" also suggests a contract set up so that facilities would get money back for recycling. This could be incorporated into the site-wide contract.

Options for Contract Changes

Basic Ordering Agreement (BOA) - A BOA is a subcontract usually for an individual or a job with a small work scope; but can involve several subcontractors and several million dollars. It's the simplest type of contract and usually used for consulting services. A BOA might be used for a site-wide recycling contract, but more specific information is needed to make a final determination.

Master Task System (MTS) - The MTS contract has been used by INEL for hazardous materials when all the interested parties worked for EG&G. When the contract is rebid for 1997, the participants will work for different companies.

Under the MTS contract, one contractor takes the lead for the DOE complex-wide contract and manages the disposal activities. The contract is based on a fixed price/unit volume. It cuts the liability and reduces costs for all involved in the contract, but does take full-time support. Each contractor provides people to work full time on this contract; the committee sends one RFP, coordinates SOWs, uses uniform language, and provides cost savings to the contractors. Recycle 2000 may mandate more cooperation among DOE contractors and more reliance on this type of contract.

WHC has a task ordered contract which is an open ended general service contract. Each task that is performed under this contract is written as a separate contract; this is very similar to the MTS.

1a. Increase Coordination with Site Groups

Cooperation with other groups would give the Pollution Prevention group more leverage to institute some of these options. Waste minimization is presently not a very high priority activity in radiological control or solid waste groups, and cooperation among all site groups involved in waste production and handling is essential for waste minimization to occur. Joint committee membership and task team participation can foster more communication among groups and lead to joint accomplishment of goals.

2. Join Existing DOE Complex-Wide Hazardous Waste Contract

INEL handles DOE complex-wide contract for hazardous waste which includes RCRA metals, mercury, silver. lead, etc. As part of their program, they have master task subcontract (MTS) with five different sites. Under this contract, the INEL recycle group charges facilities for their administration cost to recycle their RCRA waste. The generators are charged per unit volume--the more hazardous the waste, the higher the charge, and the more it weighs, the higher the charge. After the RCRA waste is sold, the generator receives the residual amount left after the expenses are deducted.

Review of the lessons learned document from placing this contract revealed that INEL first consolidated waste transportation, treatment, recycling, and disposal contracts for their own site. All regulated hazardous waste (RCRA/TSCA/CERCLA) from the five contractors at the site was consolidated on five subcontracts to reduce the environmental liability, transportation/disposal costs, number of treatments, storage, and disposal facilities (TSDFs) to eight, and specifically prohibit brokers.

From a survey conducted in 1992, INEL then determined that DOE sites had hazardous materials contracts with 200 different commercial facilities. Consolidated hazardous waste disposal contracts had been used by Boeing with 28 aircraft manufacturers, but never by a government facility.

INEL started a year long effort to unite the five interested EG&G DOE sites under one MTS. They prepared a master RFP with separate SOWs describing waste streams and services to be performed. The RFP contained specific go/no go technical criteria for evaluation of the bidders. Also an assessment was performed to qualify each bidder. The rebid for this consolidated contract has started and it will be awarded in FY 1997. The RFP for this contract is available on disk.

Two more DOE complex-wide contracts have been proposed and negotiations started for implementation. They will be similar to the hazardous waste contract that presently exists. These contracts are for off-site analytical lab tests and procurement of high liability, high ticket items. The proposed procurement contract could be tied to the closed-loop affirmative procurement contract below. Any contract where DOE sites join together will increase bargaining power.

2a. Affirmative Procurement

Establish a contract with other DOE facilities for closed-loop recycling. If this site joins with other DOE sites or other government agencies to purchase recycled products, we can cut the prices of these items. These cooperative units can create closed-loop opportunities where programs exist to collect recycled materials, and then either buy back the recycled materials made from those recycled materials or offset the costs of purchasing other materials with a credit for the recycled materials. An excellent example exists here in the Kaiser Fleet Maintenance group where tires, oil, and batteries are recycled in closed-loop systems for credit or new products. See Table 4. This type of program would reduce costs and create a direct link between purchasing recycled products and reducing the volume of waste.

Offer Incentives for Recycling

1. Return Recycling Revenue to Facilities/Projects

Establish a contract to return the money from recycling to the groups that generated the waste as part of the one DOE site contract or as a separate contract on its own. Presently money from recycling reduces the material procurement rate (MPR) which is a tax applied to all purchases made through purchasing. The money benefits the whole site by reducing this rate, but this is not visible to the individual employee. Incentives for recycling must be visible to the people responsible. At present the only incentive for facilities to recycle is that they pay less for smaller sanitary trash containers as their amount of waste decreases.

According to Public Law 103-329 and 104-52, Section 608, facilities can use their recycling revenue for:

- Conducting the recycling program
- Supporting other federal agency environmental management programs
- Financing other authorized employee programs

2. Make Financial Changes in the System

Chargeback - The Chargeback Program started in 1995 and has become the DOE Set-Aside Pilot Program in FY 1996. This program aims to reduce waste by charging generators a small fee based on type and volume of waste; the funds are used for site waste reduction activities. The program also functions as a tracking system to identify the large volume generators. DOE has established a set-aside pilot program at five sites (SRS, ORNL, SNL, LANL, and Paducah) to evaluate this fee collection system.

PNNL is also working on establishing the details of the chargeback system they will use. Under this system, the waste handling groups will charge the generators for their waste disposal plus a 10 percent surcharge for pollution prevention improvements. PNNL has estimated that they will be able to generate 4 to 6 times the revenue they receive from DOE or more than $300,000 from the chargeback system.

Solid Waste management at WHC uses a front end accrual system where a group forecasts how much waste they will have during the year, and sets up an account with the money to cover the forecast amount. There is no method to get money back to projects/facilities for recycling and other waste reduction efforts. Intergroup cooperation with solid waste groups would be required to work out a plan for chargeback.

If not recycling costs more money as it would under a chargeback system, generators will have more reason to recycle.

Passback - Money back to generators as a passback is feasible from an accounting perspective. Accounting would need identification of who would get what percentage of the money back -- This should be calculated monthly on the basis of what is recycled that month by the group. A problem could be buildings where there is more than one group, if the recycled waste is tracked by location--who gets credit??

3. Establish Contract Performance Measures with Project Specific Goals for Waste Reduction

This would establish responsibility at the generator level where it has to be for pollution prevention/waste minimization to happen. Each individual project would be required to reduce waste by an increasing amount each year to ensure the accomplishment of DOE and site goals.

Upgrade Site Tools/Processes

1. Track Construction Waste Accurately

Tracking and reporting of sanitary waste quantities for clean-up/stabilization activities deposited in on-site pits need to be improved to compare amounts diverted for recycling.

2. Change Goal Process

The goal setting methodology requires revision to incorporate a top-down approach to achieve the specified goals. Currently waste reduction annual goals and forecasts are based purely on voluntary internal goals set by the waste generators. If the 30-year solid waste forecast software is modified to provide differentiation of routine and cleanup/stabilization wastes, a more accurate projection can be obtained. Performance measures will also require updating to reflect these goals. Training and publicity of the new goals will also be needed.

3. Review Baselines and Categorization of Waste

An in depth analysis of the waste generation data in solid waste information tracking system (SWITS) to determine proper categorization of waste into routine and cleanup/stabilization wastes should be performed to verify the 1993 baseline waste generation numbers for each goal, and the baselines adjusted to delete cleanup/stabilization wastes. The 1994/1995 waste generation data also requires evaluation. In addition, the 1993 baseline should be adjusted to include newly generated waste streams that were not included in the original baseline, as these

are now reflected in the out-year waste generation rates. If the data remains as is, there is not an accurate picture of progress against the baseline.

4. Educate Purchasers

   Education of all employees who make purchases and enter information on recycled items purchased is required now that the number of EPA-designated items has increased from 5 to 24.

5. Change Waste Acceptance Criteria

   Hanford waste acceptance criteria will have to be changed to allow use of low-level radioactive carbon steel waste to make one-way disposal boxes as required by DOE's Recycle 2000 program.

6. Allow Free Release

   Change release criteria to allow free release of uncontaminated items from radiological areas instead of routinely classifying these items as radioactive waste.

Expand Present Recycling

1. Recycle/Reuse Everything Possible on Site

   As facilities are deactivated, ensure that all possible equipment and materials are recycled or reused. Recycle machine fluids by filtering and reusing all economically feasible hydraulic fluids, solvents, and antifreeze.

2. Expand Recycling to other Commodities

   From the list of materials recycled by local disposal companies below, you can see that the only commodities they recycle that we are not presently recycling are glass, aluminum and most plastics.

   Both Basin Disposal and Clayton Ward recycle:

   Cardboard
   Glass
   Plastic #1 and #2
   Aluminum/tin
   Mixed paper/magazines

   Clayton Ward also recycles copper.

   Lunchroom type glass and plastic are a possibility. The bins for glass and plastic would be located in lunchrooms. However, it is hard to estimate the amount that could be collected and the possible revenue.

A formal program for recycling aluminum does not exist site-wide. There is now an informal, voluntary program. Plant janitors now collect aluminum to supplement their income or facilities sell the cans to make money for charities, etc. A formal program could only be set up in those areas that do not have a volunteer program; however, it could cause some personnel issues with bargaining unit personnel.

Some things that are being recycled by other DOE sites include Freon, gas cylinders, styrofoam cups, and smoke detectors. We could add these items to our recycling program.

3. Advertise the Recycling/Reuse Program

Use electronic messages, colored flyers, brochures, or posters (8 1/2 by 11 inches for all facilities) to tell the site and the community about recycling program. People may be unaware of the existence of the program and the positive results that can be achieved. Advertising will help, especially if contract changes are made to get the recycling money back to the facilities.

CONCLUSIONS

The greatest challenge to profitable recycling and meeting our goals is getting cooperation from all who participate in the process. With the large number of contractor companies who are presently a part of the Hanford site, it will take increased efforts to maintain a central focus and make this program a success. All the options in the previous section will help in this effort and should be incorporated into the Hanford recycling program; however, they cannot all be done at once. The best options to immediately improve the Hanford site recycling program are listed below in order of priority for each general topic.

To change the present contract:

- Establish one overall DOE recycling contract at the Hanford site. When we have more contractors on site, a central contract and a central group will be even more necessary to keep costs as low as possible. Then investigate joining with other DOE sites and groups to accomplish similar goals and set up closed-loop procurement and recycling processes/contracts with manufacturers of recycled goods.

  One contract will also help to increase our participation with other groups so that they will be aware of waste reduction goals in their areas of concern and contribute to their accomplishment. Since recycling is part of a circular process involving purchasing recycled products that are produced from waste, cooperation among site groups is essential for success of any recycling project and requires a central group to organize the effort.

To provide incentives for recycling:

- Use a BOA or MTS contract as a way to get proceeds from recycling back to site facilities. If each facility had their own contract as part of a DOE contract with recycling vendors, they would get the money they earn from recycling activities directly back into their recycling programs as PNNL does now. This would also serve as an incentive for recycling when people see the money coming back into their own groups for funding other pollution prevention projects.

- Establish contract performance measures which hold each project accountable for specific waste reduction goals.

- Develop a market-based chargeback system that charges generators for waste generation and gives rewards for minimization or elimination of waste.

- Provide incentives for recycling and purchasing recycled products--like drawings for movie tickets used at INEL.

To upgrade processes:

- Upgrade tracking mechanisms to track and recycle construction waste which is presently buried in on-site pits.

- Refine and upgrade existing baselines, data definitions, tools/processes to provide a more accurate basis for measuring progress.

To expand recycling efforts:

- Advertise the recycle/reuse program.

- Recycle everything possible as buildings are dismantled. Implement site-wide programs for recycling fluids like hydraulic fluids and antifreeze.

- Recycle new items, even if it is not profitable, if the reduction of waste is the ultimate goal.

Attachment 1

Table 1

1993 Baseline and Source Reduction Forecasts (%) for CY 1996 through CY 2000

Waste Type	Hanford Baseline	CY 1996	CY 1997*	CY 1998*	CY 1999*	CY 2000*
Low-Level Waste (LLW) (m^3)	3865	7.2%	6.2%	6.6%	6.3%	7.3%
Transuranic Waste (TRU) (m^3)	135.8	0	0	0	0	0
High-Level Waste (HLW) (m^3)	N/A	N/A	N/A	N/A	N/A	N/A
Low-Level Mixed Waste (LLW-M) (m^3)	492	3.2%	3.2%	3.2%	3.0%	3.0%
Transuranic Mixed Waste (TRU-M) (m^3)	14.3	0	0	0	0	0
RCRA Hazardous Waste (mt)	143	2.0%	2.2%	2.4%	2.3%	2.6%
State-Only Hazardous Waste (mt)	74.6	1.3%	1.0%	1.0%	1.0%	1.0%
Sanitary (mt)	7660	3.0%	3.0%	3.0%	3.0%	3.0%

* Subject to change due to new DOE requirements for 1999. The new goals will be generated in December 1996.

Attachment 2

Tables 3 and 4

Contractor Recycle Contracts

Table 3

Present WHC Standing Investment Recovery (Recycle) Contracts

Vendor	Commodity/Contract Number	Price	Remarks
Clayton-Ward (Kim McDowell) Average per month in 96 = $2,300	Paper MMR-95-0002 Contract ends -Jan 31, 97	Paper recycling revenue = $60,000 on FY95; 7 months 96 = $16,000	Pay WHC 32.1% fair market value (FMV), provide containers and pickup
Clayton-Ward (Kim McDowell)	Cardboard MMR-95-0003 Contract ends - Sept 97	Pay WHC 1.2% FMV	Provide containers and pickup
GreenDisk (Kim McDowell)	Software PO MWH-SVV-451445 Contract ends - Feb 97	WHC pays 2.75 cents/lb plus transportation	Avoid landfill disposal costs
Pacific Recycling (Gary Carlson, Susan Raymond) Average = $35,000/month	Scrap Metal 1)ferrous 2)nonferrous 3)lead 4)brass&copper 5)furniture	%American Metals Market Price on 20th 1)91.99%/T 2)130.99%/T 3)10.99/lb 4)78.99%/lb 5)01.97cents/lb	5 year contract Nov 8 1994 to 1999 with renewal clause for 1 year. Trucks go to site and pick up. Drivers badged annually
Case-by-case (Jerry Brown)	Chemicals Drums	Chemicals in small lots now	Small revenue or break even. Eliminates disposal costs
Laser Fax (Kim McDowell)	HP 2,3,4 and Cannon Toner Cartridges Miscellaneous printer toner cartridges(separate contract)	Free pickup and reduced price buy	Pick up, determine value, invoiced for value by WHC, dispose of nonvaluable
Crystal Linen (Kim McDowell, WHC) (Dennis Poor, ICF KH)	Laundry and shop Rags - Save disposal costs for hazardous materials.	WHC pays $.05 per rag, $25 min, $.25 per lost rag.	Pick up rags monthly/wash/ return 1 month supply. started with 1000 rags and 3 stops.

Vendor	Commodity/Contract Number	Price	Remarks
Cascade Pallet (Bill Laughery - Central Stores)	No contract Pallets picked up as needed	Pallets/some scrap wood	Eliminates disposal costs
BCSR (Skip Gest/Nancy Weston)	Silver recovery to silver flake done in house. Film, paper, silver flake sent to smelter. Film containers recycled.	Hazardous waste disposal costs for silver saved. Money received for silver recovered after refining charges take off top.	Flaked silver, film, paper shipped to Eastern Smelting in MA for silver recovery. $75 charge for silver flake, $1/lb processing charge for film and paper.
Kaiser Fleet Maintenance (Loren Martin)	Tires	$25-$1000/casing depends on condition of casing and market	
"	Automotive Batteries	1 for 1 recycle/closed loop	
"	Oil	Used oil collected, sent to vendor who returns clean oil	
"	Contaminated Rags	Sent to laundry, cleaned, returned for use.	
"	Reusable Plastic Containers	Contracts with vendors require use of reusable containers	
"	Lead Weights	Reused/returned to vendor	
Consolidation Center - Kaiser	Crushed Fluorescent Tubes	3800 Recycled, 3000 Disposed	
"	Intact Fluorescent Tubes	2333 Recycled	

Vendor	Commodity/Contract Number	Price	Remarks
Consolidation Center - Kaiser	Lead Acid Batteries	42,272 Recycled	
"	Aerosol Products	250 Redeployed	
"	Copper (from DOP ballasts)	172 Recycled	
"	Ferrous Metal (from DOP ballasts and aerosols), Water based paints, Chlorinated and non-chlorinated based solvents, Solvent based thinners and paints	TBD	Kaiser recycling savings for 1995 = $404,707 Average month = $33,725

Table 4

Other Hanford Site Standing Recycling Contracts

Company	Commodity	Price	Remarks
PNNL (Jill Engel)	PNNL has a multicomodity program for plastic, glass, paper, cardboard, and paper board.	PNNL paper revenue pays $600/month, enough to pay for person 4 hours/week to coordinate their program.	All revenues used for recycling contract expenses. PNNL recycling savings for 1995 = $250,290 Ave month = $20,857
Bechtel	Concrete, office materials, metal	1,100 cubic yards (400 metric tons) of concrete recycled	Recorded savings from recycling for 1995 = $62,225 Ave month = $5,225

Attachment 3

EPA- Designated Items for Affirmative Procurement of Recycled Content Products

Category	Original Items (Year Designated)	Newly Designated Items (Effective May 1996)
Construction Materials	- cement and concrete containing fly ash (1983) - building insulation (1989)	- cement and concrete containing blast furnace slag - carpet - floor tiles - laminated paper board - patio block - structural fiberboard
Landscape Products		- hydraulic mulch - yard trimmings compost
Non-Paper Office Products		- binders - office recycling containers - office waste receptacle - plastic desktop accessories - toner cartridges
Paper Products	- coated printing and writing paper - bristols (file folders, index cards, tags, tickets) - newsprint - tissue products - uncoated printing and writing paper (all paper products designated in 1988)	
Park and Recreation		- playground surfaces - running tracks
Transportation Products		- traffic cones - traffic barriers
Vehicular Products	- retread tires (1988) - re-refined lubricating oils (1988)	- reclaimed engine coolant

Reference: Comprehensive Procurement Guideline (60 CFR 21370 May 1, 1995) and the Recovered Materials Advisory Notice (60 CFR 21386, May 1, 1995)

Attachment 3

EPA-Designated Recycled Items

for

Affirmative Procurement

Distribution List:

EB Dagan (2)..S7-55
DS Merry (7)..B3-28
IM Leonard (2)..B3-28
JR Kirkendall (1)..B3-28
DE McKenney (1)..T3-01

Central Files (1)..A3-88
DPC (1)....A3-94
PNNL Tech Library (1)...K1-11

Pollution Prevention (E)
P. Segall
DH Nichols
MD Betsch
RJ Uhlrich
J. Renner

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