

FUNDING ALTERNATIVES FOR LOW-LEVEL WASTE DISPOSAL

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ABSTRACT

For 13 years, low-level waste (LLW) generator fees and disposal volumes for the U.S. Department of Energy (DOE) National Nuclear Security Administration Nevada Operations Office (NNSA/NV) Radioactive Waste Management Sites (RWMSs) had been on a veritable roller coaster ride. As forecast volumes and disposal volumes fluctuated wildly, generator fees were difficult to determine and implement. Fiscal Year (FY) 2000 forecast projections were so low, the very existence of disposal operations at the Nevada Test Site (NTS) were threatened. Providing the DOE Complex with a viable, cost-effective disposal option, while assuring the disposal site a stable source of funding, became the driving force behind the development of the Waste Generator Access Fee at the NTS. On September 26, 2000, NNSA/NV (after seeking input from DOE/Headquarters [HQ]), granted permission to Bechtel Nevada (BN) to implement the Access Fee for FY 2001 as a two-year Pilot Program. In FY 2001 (the first year the Access Fee was implemented), the NTS Disposal Operations experienced a 90 percent increase in waste receipts from the previous year and a 33 percent reduction in disposal fee charged to the waste generators. Waste receipts for FY 2002 were projected to be 63 percent higher than FY 2001 and 15 percent lower in cost. Forecast data for the outyears are just as promising. This paper describes the development, implementation, and ultimate success of this fee strategy.

INTRODUCTION

Conducting a program where waste volumes are a critical parameter to determining manpower resource requirements, was extremely difficult during the 1990's. To make resource loading even more difficult, shipments tended to lag in the early months of the fiscal year and reach their peak at the end. The annual volume fluctuations had many causes, some even self-imposed. In 1991, a DOE/HQ Tiger Team shut down the acceptance of LLW because of programmatic deficiencies. FY 1994, was affected first by congressional budgetary Continuing Resolutions and then by a DOE Inspector General audit recommendation that generator fees be adjusted quarterly. Waste disposal fee increases, driven by a desire to promote waste minimization, resulted in lower-than-expected waste receipts in FY 1996. A major NTS waste shipper opened an on-site disposal facility in 1997, and the next year experienced package integrity failure

significant enough to shut down their off-site disposal shipments to the NTS for over a year. Reduced volume can also be attributed to a certain amount of programmatic arrogance and a failure to respond to customer needs.

FY 2000 forecast projections were so low that the very existence of disposal operations at the NTS was threatened. Initial volume projections of 410,000 cubic feet (ft³) would have driven disposal costs to prohibitive highs. Difficult negotiations with waste generators resulted in a compromise. The NTS would place disposal operations in a stand-by mode for three months during the year. The resulting cost savings would be factored into a revised disposal fee. In return, waste generators would reassess priorities and fund additional LLW disposal.

FY 2000 experience became a wake-up call. The RWMSs at the NTS were faced with a dilemma. Confronted with diminishing LLW forecasts and increasing costs, there were few choices. A risk analysis was performed. In addition to temporarily suspending operations, various other operational and funding scenarios were evaluated. Those evaluations included:

- reduce staff and alternate operations between the Area 3 and Area 5 RWMSs on a six-month basis;
- operate both RWMSs and supplement the generator fee with DOE/HQ funding;
- direct-fund disposal operations completely;
- direct-fund disposal operations, but charge generators a minimal fee for infrastructure and equipment upgrades; and
- charge waste generators for forecasted volumes instead of disposed volumes.

One option not considered was the elimination of the NTS off-site disposal program and placing the RWMSs into full closure mode.

Whichever approach was chosen, it became obvious that in order remain a viable LLW disposal option for the DOE complex, the NTS Disposal Operations could no longer operate without a stable source of funding. This would prove to be prophetic, for on February 25, 2000, DOE/HQ issued the Waste Management Programmatic Environmental Impact Statement Record of Decision (PEIS/ROD). The ROD identified the NTS as one of two regional DOE LLW disposal facilities. This would be a major driver in the approval of what would become known as the Access Fee.

After experiencing two of the three 1-month operational suspensions in FY 2000, waste generators began encountering storage space limitations and missed milestones. Several generators inquired about NTS Disposal Operations funding shortfalls and requirements to remain open for the remainder of the year. A request by one generator to trade extra funding for unrestricted access to the disposal sites was denied on the grounds that special rates for a single generator may not withstand examination by a DOE Inspector General audit. Negotiations for increased shipments from all generators began and resulted in enough additional volume and fee that the third and final operational suspension was canceled.

ACCESS FEE DEVELOPMENT

Once the immediate situation encountered in FY 2000 had been resolved to the satisfaction of both the generators and disposal site, attention could be focused on the long-term problem of providing the DOE Complex with a viable, cost-effective disposal option, while assuring the disposal site a stable source of funding. The original idea was born out of the risk analysis, along with some discussions with one of the generator sites: *Charge the generators for waste volumes forecast and grant them unlimited access to the disposal facility.* This original concept, although crude, was the foundation upon which the Access Fee was built. The Access Fee was easily “projectized” by incorporating the principles of Scope, Schedule, and Funding.

Scope

First, the scope had to be defined. Under the “unit rate” funding process, a level-of-effort scope was to maintain the capability and capacity to dispose a projected volume of waste. That projected volume equated to the sum of all the waste generators’ forecasts. The scope was only an approximation because as historical records indicated, actual annual LLW volumes received ranged from a low of 48 percent of the forecasted volume to a high of 148 percent. That represented a 100 percent swing in scope and made accurate resource loading difficult.

The Access Fee funding process still relies on generator forecasts, but has partially bounded the scope by placing an upper limit on the volume of waste that would be accepted in any given year. The scope definition process would work as follows. When the generator forecast information is received, it is grouped and totaled by DOE Field Office. The cumulative forecast is the sum of all DOE Field Offices and “Work-For-Others” projects. In this case, a “Work-For-Others” project involves LLW generated at non-DOE facilities utilizing DOE-owned nuclear materials or “classified waste” generated at a Department of Defense facility. Disposal Operations determines what manpower and equipment resources will be needed to accept the forecasted amount of waste. Those resources are further evaluated to determine how much additional waste, if any, could be managed with no increase in resources and without sacrificing facility maintenance capability. That additional waste volume becomes the upper volume scope limit. The delta volume, the upper volume limit minus the forecast volume, is distributed back to the Field Offices based on their percentage of the total forecast. When a Field Office receives a delta volume, they are free to establish the priority as to how that volume of waste is utilized. In other words, they usually give that additional volume to their contractor most likely to ship additional waste. This concept has done more to level-load the shipping schedules than any other aspect of the process.

Schedule

For years, the best scheduling assumption was to simply level-load the forecast. Later, data calls requested that forecast information be broken down by the months in which the generator expected to ship the waste. This improved the data to a degree, but waste receipts still tended to follow the traditional patterns of low shipment volumes in the first quarter of the fiscal year and heavy shipment volume in the last quarter.

For the most part, this scheduling process is also used for the Access Fee. Data calls have become more sophisticated. Forecast monthly schedules have been broadened to break the waste volumes down into waste forms such as Asbestos LLW, Mixed LLW, “Classified LLW,”

Remote-Handled LLW, and all other nonspecific LLW. The term *nonspecific LLW* used in this context is that LLW that does not require separate management at the RWMS. The waste form information is requested for the current year plus five outyears. Although the additional forecast information does not, in itself, improve waste shipment schedules, it does provide Disposal Operations with a planning tool for scheduling future disposal cell development.

Funding

Disposal fees as unit rates were calculated from the operational budgets. Because resource loads rarely fluctuated in the past, unit rates essentially became a function of volume forecast. If the disposal site was fortunate, the actual waste receipts and subsequent disposal fees equaled or exceeded the forecast and operational costs. In those years when fortune was not on the side of the disposal facility, waste receipts were lower than forecasted, disposal fees were insufficient to cover operational costs, and Disposal Operations had to find supplemental funding.

The funding process experienced the greatest change under the Access Fee. Once the forecast is received and the upper limit is established, Disposal Operations finalizes costs for the required resources. Other considerations included in the Disposal Operations budget are facility upgrades such as new disposal cells, capital equipment replacement, authorization basis documentation, and the state of Nevada Rural County Emergency Response Surcharge. Each Field Office's aggregate forecast is then calculated as a percentage of the cumulative or total NTS forecast. The Field Offices' aggregate forecast percentages then become the basis for their disposal fee. For example, if a Field Office aggregate forecast accounts for 25 percent of the total NTS forecast, then that Field Office pays 25 percent of the NTS Disposal Operations budget. This fee is paid up front at the beginning of the fiscal year and is not refundable. In return for paying this non-refundable disposal assessment, NNSA/NV guarantees the availability of the disposal site to this Field Office.

If the scope will accommodate accepting additional waste volume, the Field Office will also receive 25 percent of the delta volume, which they can ship for disposal for no additional fee. As mentioned earlier, this distribution of excess capability back to the Field Offices has encouraged generators to ship larger volumes earlier in the year, allowing them to take advantage of this extra disposal volume. This delta volume is often called the efficiency volume because it enables the Disposal Operations to work closer to peak efficiencies throughout the year.

IMPLEMENTATION

On September 26, 2000, NNSA/NV (after seeking input from DOE/HQ) granted permission to BN to implement the Access Fee for FY 2001 as a two-year Pilot Program. Some problems were encountered the first year, but most of those can be attributed to the fact that the Access Fee was not fully ready for implementation.

First, all scope and budgets were initially developed using a unit rate (dollars per ft³). In February 2000, DOE/HQ issued the PEIS/ROD, which allowed all DOE sites to apply to the NNSA/NV for approval to ship LLW to the NTS. To help implement the ROD, NNSA/NV included all DOE Field Offices and their contractors in the FY 2001 LLW forecast data call. However, when developing the scope for the upcoming year, waste generators who had not completed the NTS approval process could not have their LLW volumes included in the initial

scope and budget. This required the flexibility to perform a midyear adjustment of the scope and budget.

The second problem was that the details of the billing process had not been thought through. The initial plan was to bill the Field Offices directly for their aggregate forecasts, reducing the number of billable accounts from a potential 32 down to 11. The final billing process had to incorporate multiple fund types such as Defense Programs, Environmental Management and Office of Science, from several Field Offices. In addition, some national laboratories receive their funding allocations directly from DOE/HQ and have to be billed separately from their oversight Field Office. Currently, 16 different accounts are billed, which is still an improvement from a potential 32.

Once the scope of work was established in the form of an upper limit of waste, the question arose; can a Field Office ship more than their allotment? Initially, it was suggested to accept the extra waste, but charge a unit rate high enough to cover the cost of any additional required resources. Because this extra volume of waste would arrive at the end of the year, it was soon recognized that those resources would be short-term and perhaps difficult to develop. The resolution was that if a Field Office wanted to ship additional waste above their upper limit, then they could utilize another Field Office's unused capacity if it was mutually agreeable between the two Field Offices. This resolution enabled a Field Office to meet their needs and keeps Disposal Operations within scope.

The final major problem to be resolved was, how can LLW generators and LLW disposal facilities work together to bring forecast volumes more in line with end of the year actual disposed volumes? The root of this problem is not that the generator sites do not want to meet their commitments, but that the forecast data calls are made early in the budgetary planning process. More often than not, at the beginning of the new fiscal year, funding allocations and priorities may have changed. LLW disposal, being a low-priority item at all but the closure sites, is usually the first to feel the effects of reduced funding. Although this problem is not related to the Access Fee, NNSA/NV (after consultation with DOE/HQ and the generator sites), has committed to delaying the final forecast data call until the DOE Appropriations Act is approved.

ACCESS FEE VERSUS UNIT RATE

As shown in Table 1, in FY 2001, the first year the Access Fee was implemented, the NTS Disposal Operations experienced a 90 percent increase in waste receipts from FY 2000, the base year, and a 33 percent reduction in disposal fee charged to the waste generators. Waste receipts for FY 2002 were 258 percent higher than the base year and 51 percent lower in cost. Forecast data for the outyears are just as promising. The FY 2003 preliminary forecast, for example, is projected to be 523 percent higher than FY 2000 waste receipts. The rate increase in FY 2003 can be attributed to several factors. First, the large volume of waste will require construction of two new disposal cells. Second, higher activity waste has mandated development and implementation of a Category 2, Non-reactor Nuclear Facility safety program. Finally, a decision was made to shift more of the total lifecycle disposal costs to the generator community.

Table I Waste Receipts versus Costs

Fiscal Year	Waste Received – Ft³	Percent Increase from Base Year	Cost per Cubic foot to DOE	Percent Savings to DOE from Base Year
2000 *	646,133	*	\$9.00	*
2001	1,230,147	90%	\$6.04	33%
2002	2,314,723	258%	\$4.42	51%
2003 **	4,028,072	523%	\$5.50	39%

*Base Year

** FY 03 Projection

Table 2 illustrates a comparison of data averages from FY 1991 through FY 2000 (the last ten years the Unit Rate was used) to 2001-2002 (the first 2 years for the Access Fee).

Table II Waste Forecasts versus Waste Receipts

Fiscal Years	Average Forecast	Average Receipts	Average Unit Rate
FY 1991-2000	798,411 ft ³	643,100 ft ³	\$10.13 / ft ³
FY 2001-2002	1,338,572 ft ³	1,772,435 ft ³	\$5.23 / ft ³

As the comparison of the two time frames illustrated above indicates, during the two years the Access Fee has been used, the NTS has experienced a 68 percent increase in forecast volumes, 176 percent increase in disposed volumes and, more importantly, a 48 percent decrease in disposal cost to the DOE Complex.

The Access Fee resolved problems that had plagued the off-site waste disposal program at the NTS for years. The requirement that DOE Field Offices pay a nonrefundable disposal assessment at the beginning of the fiscal year does two things. First, it allows BN Disposal Operations to resource load to a fixed scope of work. Accurate resource loading is key to developing cost estimates intended to provide a cost-effective service. Second, prepaying for waste disposal provides an incentive to the generator to ship the forecasted waste. In the past, there was no penalty associated with reneging on a forecast. In fact, unpaid disposal fees became targets for higher priority projects.

Although not as readily apparent as solving the fiscal problems that faced the disposal operations, the Access Fee has provided other benefits. It has increased the efficiency and productivity of the work force at the disposal site. By carefully evaluating the forecast volumes and determining the actual capability of the resources, additional waste volumes may be able to be accepted and managed. Further, by the Field Offices controlling the disposal funding, they can shift disposal volumes from one generator site to another if a particular generator site experiences programmatic difficulties. These benefits to the DOE Complex could never have been realized under another funding scenario. History has shown that unit rate pricing more often than not results in underrecovery of cost and inefficient resource loading. Direct funding of disposal operations has been suggested many times. Direct funding may be appropriate under static conditions where waste volumes fluctuate very little from year to year. However, accelerated closures of many DOE sites have resulted in an entirely different situation. Under

the dynamic conditions that the NTS disposal facilities have been experiencing, direct funding would not work. No one could have foreseen with any degree of accuracy the need to increase funding and resources to handle a 300 percent increase in scope over a three-year period. A direct-funded budgetary process could not have reacted quickly enough to meet the needs of the Complex. Only the flexibility of the Access Fee has enabled the NTS to respond to that challenge.

CONCLUSION

The Access Fee was the right decision at the right time for DOE Complex and the NTS:

- It provides the NTS Disposal Operations with a stable source of funding,
- It provides the DOE Complex with a cost-effective LLW disposal option,
- It improves productivity by allowing the NTS Disposal Operations to work closer to peak efficiency,
- It enables DOE to accelerate the closure of some sites,
- It enables Field Offices to shift priorities if one generator site encountered programmatic problems, and
- It enables Field Offices to prioritize allocation of additional disposal volumes when available.

REFERENCES:

1. Waste Management Programmatic Environmental Impact Statement Record of Decision, February 2000.