

8.0 CLOSURE PLAN

The closure plans described in this section of the permit application identifies how ATK will close the regulated units on the NIROP. The NIROP is owned by the Navy and is operated by ATK Launch Systems Inc., as an integral part of the Bacchus Facility. Based on 40 CFR 265.140(c), and since the facility is owned by the Navy, it is exempt from financial assurance requirements. ATK has provided closure cost estimates for information purposes only. The closure plans have been developed for the following hazardous waste storage and treatment areas: ES-2, Burning Grounds Ash Storage Pad, and NIROP Burning Grounds.

8.1 CLOSURE PLANS AND CLOSURE COST ESTIMATES

In developing the clean closure plans for the aforementioned hazardous waste management units, ATK used the requirements of R315-8-7 and R315-8-9.9 UAC. R315-8-7 UAC incorporates by reference the requirements of 40 CFR 264 Subparts G. The closure cost estimates were made in accordance with R315-8-8 UAC, which incorporates by reference the requirements of 40 CFR 264 Subpart H.

ATK assumed, for the purposes of estimating the closure costs, that the hazardous waste management units were filled to their respective maximum waste storage capacities as identified in the RCRA Part A Permit Application for NIROP. If storage capacities change, the Permit will be modified.

8.2 CLEAN-UP APPROACH

With the exception of the NIROP Burning Grounds, the other hazardous waste management units listed in the Part A only store explosive/hazardous waste. The source of any contamination occurring in these units would be limited to spill or releases of hazardous waste or constituents onto concrete or asphalt surfaces. The units will be cleaned using steam and/or high-pressure water until surfaces are decontaminated. This method has been routinely used at Bacchus Facility to clean various areas as a part of normal plant maintenance. Wash water from ES-2 and the Ash Storage Pad will be collected using temporary or permanent berms and sumps to prevent contaminating the surroundings. Wash water from the NIROP Burning Grounds pad will be collected using the current collection/conveyance system and treated at the NIROP Burning Grounds storm water treatment plant. Past experience indicates that contamination in the cleanup wash water will be minimal, and after characterization the water will meet discharge limits for a POTW or UPDES discharge permit. Therefore, it is not anticipated that the wash water generated during the closure will require special handling. The wash water will be collected according to Bacchus Facility practices. It will then be stored, tested, and disposed. If it is determined that the wash water cannot meet discharge limits, it will be characterized and disposed according to applicable rules and regulations.

Because of the hazardous nature of the explosive materials on site and complex plant safety procedures, Bacchus Facility personnel will be involved in closure activities more than would be the case at other types of hazardous waste management facilities. For cost-estimating purposes, it was assumed that a third-party consulting firm will be employed to clean buildings and grounds after explosive materials have been removed, conduct verification sampling, and write the final closure reports.

Once hazardous/explosive waste storage buildings and treatment units have been decontaminated and verified clean, ATK will submit a written report to the Executive Secretary requesting concurrence on the closure certification. Before any unit can be clean closed, ATK must have concurrence from the Executive Secretary of the Utah Solid and Hazardous Waste Control Board. The final disposition of any hazardous waste management unit listed in this permit application that

has been clean closed will be the prerogative of the NIROP Facility owner. If a hazardous waste management unit cannot be clean closed ATK will develop an appropriate and applicable post-closure care mechanism.

The NIROP Burning Grounds treats reactive wastes. A due diligence investigation, conducted in 1994 by ATK, did not detect significant soil contamination surrounding the NIROP Burning Grounds. Soils at the NIROP Burning Grounds will be cleaned closed in accordance with R313-8-7 and 315-101 of the UAC. Groundwater is currently being monitored and will continue to be monitored post-closure. A post-closure plan for the groundwater will be developed according to R315-8-7 and R315-101 of the UAC.

It is assumed that the RCRA Facility Investigation will be completed before closure occurs, and that the nature and extent of any contamination will have been defined. That data will be used to develop the final work plans for cleanup of the facilities named here. For that reason, the emphasis in closure will be on verification sampling to ensure that the decontaminated facility meets closure criteria.

8.3 CLEAN CLOSURE CRITERIA

For the purposes of estimating closure costs, it is assumed that all of the regulated units will be clean closed. Clean closure can be achieved by cleaning the units to background conditions or by meeting the clean closure equivalency as defined in R315-101-6(c)(1) UAC. All closures will assess real and potential impacts to human and ecological exposures.

The Regional Screening Levels for Contaminants of Concern at Superfund Sites, July 2008, (RSLs) is now used by USEPA Region 9 and will be used to screen the data under a residential land-use scenario. Preliminary remediation goals (PRGs) from EPA Region 9 (Smucker, 2002) are no longer used. RSL goals will be established prior to implementing any of the closure plans in this section. ATK will use the screening levels published by USEPA Region 9, or they can establish site-specific risk-based clean closure goals in accordance with R315-101-5.2 UAC.

8.4 VERIFICATION SAMPLING APPROACH

To determine whether each hazardous waste management unit has been successfully decontaminated and cleaned, ATK will use the following techniques:

- Core samples will be collected from floors where liquid hazardous wastes were stored, and from locations where porous flooring materials are present. Sample locations will be biased toward visible staining or other indication of potential contamination, such as the source of the material, coloration, or floor integrity. Cores obtained from the floors will have the top 1-inch (unless staining or discoloration indicates contamination below that depth) sawed off and pulverized in the laboratory before being analyzed for the contaminants of concern. Material used for samples will not exceed 1-inch maximum in depth. If additional material is needed for analysis, additional cores will be collected by co-locating additional cores near the original sample point. In situ samples will always be discrete samples without compositing.
- Wipe samples will be collected from the wall surfaces in the buildings when applicable. The sample will be collected by wiping the surface of a designated area using a template with a piece of solvent moistened gauze to remove any remaining contaminants. The wipe will be placed into a glass vial for storage and transport. Samples will be handled according to applicable sample preservation and chain-of-custody requirements.
- Final rinse water samples will be collected in buildings where non-liquid hazardous wastes were stored and from all non-porous surfaces. The rinse water samples will be

analyzed and evaluated to determine whether the exposed surfaces of the buildings have been adequately decontaminated.

- Soil samples will be collected where the potential existed for hazardous waste materials to be transposed to soil areas surrounding the designated building area. Samples will be collected in areas with the greatest potential to have received waste materials, visible staining of soil, or other indication of contamination. Each sample will be discrete and without compositing with samples from other locations. However, the sample for non-volatile compounds may be a composited within the sample interval. Analytical results will be compared with the closure performance standard presented for the specific hazardous waste management unit.
- Prior to implementing the closure plans described in this section of the application, ATK will develop Data Quality Objectives (DQOs) for all verification samples. The DQOs will be submitted to the Executive Secretary for approval prior to implementing any of the closure plans.
- The unit will be considered clean if the verification samples show that all contaminant concentration levels are less than the background concentrations or a risk-based clean closure equivalency as defined in R315-101-6(c)(1) UAC.
- Sampling and handling will be conducted according to the requirement and protocols established by the USEPA and DEQ.
- All samples will be processed and analyzed by a Utah Certified Laboratory in accordance with R444-14-3(2) UAC. Analytical and extraction methods to be used are shown in Table 8-1.

TABLE 8-1 ANALYTICAL AND EXTRACTION METHODS		
Parameter	Analytical Procedure	Extraction Procedure
Volatiles	SW-846; 8260B	SW-846; 5030B(W), 5035S
Semi-Volatiles	SW-846; 8270C	SW-846; 3510C(W), 3550B(S)
RCRA Metals	SW-846; 6010B	SW-846; 3005A(W), 3050B(S)
Mercury	SW-846; 7470A/7471A	SW-846; 7470A(W), 7471A(S)
Explosives	SW-846; 8330 Modified	SW-846; 8330 Modified
Perchlorate	EPA 314.0	EPA 314.0

8.5 NIROP EXPLOSIVE WASTE CONTAINER STORAGE FACILITY (ES-2)

ES-2 is an explosive waste storage unit that ATK uses for the storage of propellant and explosive wastes.

8.5.1 Site Description

ES-2 is a totally enclosed structure constructed of concrete and steel. The building was originally constructed for storing and weighing dry propellant ingredients. The floor is electrically-conductive for the continuous grounding of personnel. ES-2 has the capacity to store 40,000 pounds of explosive or flammable solids. Explosives are generally stored in

“SLIDs,” sections of cardboard cylinders used for casting pilings that are mounted on a plywood base, and in anti-static bags. Figure 8-1 provides a floor plan and a typical storage configuration of the building. The building is protected by a grounded deluge sprinkler system. Fire symbols appropriate for the greatest explosive waste hazard are clearly posted on the exterior of the building. The building is shown in Figure 8-2.

8.5.2 ES-2 Closure Plan

The closure plan detailed in this section was developed with the assumption that ES-2 will be clean closed. The plan describes the procedures that will be used to clean, decontaminate, and verify closure of all applicable structures and equipment at ES-2, and how the closure standard will be established. Any change or amendment to this plan will be done in accordance with R315-8-7 UAC and 40 CFR 364.112(c).

8.5.3 Closure Performance Standard

This unit will be clean closed by either cleaning the unit until it meets background conditions or by meeting a clean closure equivalency as defined in R315-101-6(c)(1) UAC. After closure, ES-2 may be used for other purposes, or may be demolished. Post-closure care for ES-2 is not anticipated.

8.5.4 Operational History of Spills or Releases at ES-2

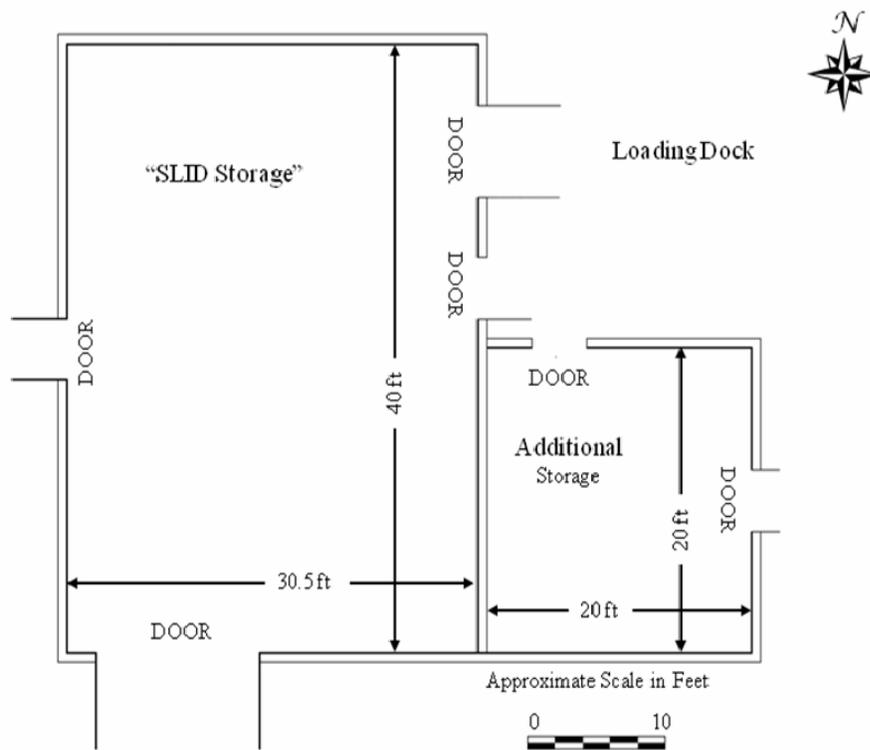
At the time this plan was written there was no history of any major spills occurring at ES-2. Whenever a minor spill occurred, it was immediately cleaned up. Prior to closure the operational history of ES-2 will be reviewed to determine when and where spills have occurred. Prior to implementation of the closure plan, the floor in ES-2 will be evaluated for cracks and gaps. If cracks or gaps exist, the closure plan will be amended to assess the potential migration of contaminants through the floor of ES-2.

8.5.5 Maximum Waste Inventory at ES-2

Based on our operating history, the maximum inventory of hazardous waste documented on-site was equal to approximately 20,000 pounds; the permitted storage capacity of ES-2 is 40,000 pounds. The principal waste stored at ES-2 has been Class 1.1 explosive waste. The majority of the wastes stored at ES-2 are treated at the NIROP Burning Grounds since these wastes do not have DOT authorization for offsite shipment. Prior to implementing the closure plan, the operational history will be reviewed to determine what reactive hazardous waste or constituents ATK stored at the ES-2 during its operational life.

8.5.6 Inventory Removal, Disposal, and Decontamination of Structure/Equipment

Any bulk explosives remaining at the time of closure will be taken to the NIROP Burning Grounds for disposal. The storage areas, equipment, structure, etc., will be decontaminated by steam cleaning and/or washing with high pressure water and scrub brushes. A temporary berm will be constructed using plastic and railroad ties, or a similar structure, to contain wash water. Wash water will be collected and transferred into a 55-gallon drum or similar vessel. An environmentally safe detergent, if necessary, may be used. The decontamination process is expected to generate approximately 500 gallons of wash water and residue.



ES-2 Floor Plan
Figure 8-1



Explosive Storage (ES-2)

Figure 8-2

The building may be subdivided into more than one area for cleaning purposes. Structures and equipment requiring decontamination include, but are not limited to, the following:

- Concrete floor in the building;
- Walls that may have been exposed to contamination; and,
- Miscellaneous equipment permanently attached to the facility.

All material used to construct the temporary berm will be collected, characterized, and discarded according to applicable and appropriate waste management rules.

8.5.7 Verification and QA/QC Samples

Decontamination and verification samples will be collected from storage areas at ES-2. From experience, contaminants in the decontamination wash water are expected to be very low. This wash water will be sent to a local POTW following approval or verification that discharge limits can be met.

To demonstrate adequate decontamination, verification samples will be collected from the storage area. Final rinse samples of the floors and walls will be collected. Wipe samples will be collected from two walls in each storage area. Samples will be collected according to the procedure described in Section 8.4.

Table 8-2 (found in the *Tables* section following this chapter) identifies the number of verification and QA/QC samples that ATK expects to collect during the closure of ES-2. In addition to the clean closure verification samples identified in Table 8-2, the following QA/QC samples will be collected during each day of verification sampling:

- A field blank filled with de-ionized water will be exposed during sampling, and then analyzed to detect accidental or incidental contamination, during each day of sampling.
- A trip blank bottle will be filled with de-ionized water and carried with the decontamination/sampling crew to ES-2. The trip blank bottles shall be handled identically to the handling methods used for sample collection and subjected to the same analyses.
- One (1) blind duplicate sample will be collected for each ten (10) verification samples collected (rounded up to the next greatest multiple of 10).

Samples will be properly labeled, sealed, and sent to a Utah Certified Laboratory for testing. Samples will be handled under USEPA chain-of-custody and sample preservation protocols. No residue or contamination is expected to remain on or in the structures and equipment following the decontamination process. Structures and permanent fixtures may be kept for future use. There is no intention to break up and dispose of the building as part of the closure.

8.5.8 Closure Report and Certification

Upon completion of the closure, a report will be provided to the Executive Secretary certifying that the closure was completed in accordance with the plan. The report will include a summary of the operational history of ES-2, copies of the analytical results, copies of the QA/QC data, data validation report(s), copies of manifests that accompanied off-site shipments of wastes, characterization of decontamination water/residue, documentation that the closure of ES-2 met the performance standard identified in Section 8.5.3, and a closure certification. A certification of closure according to 40 CFR 264.115 will be submitted by registered mail to the Executive Secretary within 60 days of the completion of the final closure.

8.5.9 Schedule for Closure

Final closure is expected to be initiated within 30 days of receipt of the final volume of hazardous wastes. If more time is required, ATK will submit a request to the Executive Secretary. All hazardous wastes will be removed or treated within 90 days of: (1) plan approval, or (2) after receiving the final volume of hazardous waste, whichever occurs last. Final closure activities will be completed within 180 days of: (1) plan approval, or (2) after receiving the final volume of hazardous waste, whichever is later.

8.5.10 Post-Closure Care

The closure plan described above anticipates that ES-2 will be clean closed and will not require post-closure care. If at the conclusion of the closure activities it is determined that ES-2 cannot be clean closed, ATK will develop an appropriate and applicable post-closure care plan for all areas of this unit that cannot be clean closed. Any proposal for post-closure care will be developed in accordance with R315-8-7 and 8 UAC and 40 CFR 264, Subpart G and H, and submitted to the Executive Secretary for approval.

8.5.11 Closure Cost Estimate

The cost estimate for the closure of ES- is presented in Table 8-3.

8.6 BURNING GROUNDS ASH STORAGE PAD

The Burning Grounds Ash Storage Pad is a hazardous waste storage unit constructed for the storage of ash generated from the treatment of energetic wastes. The residual ash is no longer a reactive waste, but is considered an F-listed waste based on the presence of organic solvents.

8.6.1 Site Description

The Burning Grounds Ash Storage Pad is a 45 ft x 45 ft concrete pad located outside of the NIROP Burning Grounds fence. The pad is designed to contain two ash storage containers (Figure 8-3). The containers are covered except when waste is being added. The pad may also be used to accumulate scrap metal generated at the NIROP Burning Grounds; the scrap metal dumpster will not need to be covered. This storage unit has a maximum capacity of 50 cubic yards.

8.6.2 Ash Storage Closure Plan

The closure plan detailed in this section was developed with the assumption that the Ash Storage area will be clean closed. The plan describes the procedures that will be used to clean, decontaminate, and verify closure of all applicable structures at the Ash Storage area, and how the closure standard will be established. Any change or amendment to this plan will be done in accordance with R315-8-7 UAC and 40 CFR 264.112(c).

8.6.3 Closure Performance Standard

The closure criteria for the pad and surrounding soil will be to clean close by both cleaning the unit and surrounding soil until they meet background conditions, or by meeting a clean closure equivalency as defined in R315-101-6(c)(1) UAC. If the pad can be clean closed, the pad may be used for other purposes, or may be demolished. No specific Ash Storage post-closure monitoring is planned.



Ash Storage Pad
Figure 8-3

8.6.4 Operational History of Spills or Releases at Ash Storage Pad

At the time this plan was written there was no history of any major spills occurring at Ash Storage Pad. Prior to closure the operational history of Ash Storage Pad will be reviewed to determine when and where any spills have occurred. Contaminated soil is not expected; however, limited sampling will be conducted to verify that it does not exist.

8.6.5 Maximum Waste Inventory at Segment Storage

Ash Storage Pad has a storage capacity of 50 cubic yards of ash. The pad has been used to stage a single gondola for NIROP Burning Grounds ash. Prior to implementing the closure plan the operational history will be reviewed to determine what other hazardous wastes or constituents, if any, ATK stored at the Ash Storage Pad during its operational life.

8.6.6 Inventory Removal and Decontamination of Pad

All hazardous wastes in storage at the time of closure will be taken to an approved TSD for treatment and disposal. The pad will be cleaned to remove any visible dirt or debris present during closure. The pad will be swept, and then pressure washed. Wash water will be collected and, if possible, sent to a local POTW following approval or verification that discharge limits have been met. It is assumed that the pad will be removed after closure. Soil contamination is not expected; however, if it is identified, the soil will be excavated, stabilized, and sent to an approved waste landfill for disposal. If soils contamination is identified, ATK will submit a supplemental closure plan to the Executive Secretary designed to assess magnitude and extent of the contamination. This supplemental plan will be submitted within 60 days of determining that soil contamination has occurred.

8.6.7 Verification and QA/QC Samples

To demonstrate adequate decontamination, verification samples will be collected from the storage pad and specific soil locations.

Table 8-4 (found in the *Tables* section following this chapter) identifies the number of verification and QA/QC samples ATK will collect during the closure of Ash Storage. One rinsate sample of the pad wash water will be collected. A total of two soil samples will be collected from the soils adjacent to the pad from 0 to 6-inch depth, in the general direction of water runoff, i.e., to the north and east. In addition to the verification samples, QA/QC samples will be collected during each day of verification sampling. During closure activities field blanks will be collected daily and duplicate samples will be collected according to the bullets below:

- A field blank filled with de-ionized water will be exposed during sampling and analyzed for accidental or incidental contamination.
- A trip blank bottle will be filled with de-ionized water and carried with the decontamination/sampling crew to Ash Storage Pad. The trip blank bottles shall be handled identically to the handling methods used for sample collection and subjected to the same analyses.
- One (1) blind duplicate verification sample will be collected for each ten (10) verification samples collected (rounded up to the next greatest multiple of 10).

Samples will be properly labeled, sealed, and sent to a Utah Certified Laboratory for testing. Samples will be handled under USEPA chain-of-custody and sample preservation protocols. No residue or contamination is expected to remain on the pad or any of the equipment associated with Ash Storage Pad after the cleaning process is complete, therefore, the pad may be kept for future use.

8.6.8 Closure Report and Certification

Upon completion of the closure a report will be submitted to the Executive Secretary certifying that the closure was accomplished in accordance with the approved plan. The report will include a summary of the operational history of the Ash Storage Pad, copies of the analytical results, copies of the QA/QC data, data validation report(s), copies of any manifests that accompanied off-site shipments of wastes, characterization of all cleanup waste or residues, documentation that the closure of Ash Storage Pad met the performance standard identified in Section 8.6.3, and a closure certification. A certification of closure according to 40 CFR 264.115 will be submitted by registered mail to the Executive Secretary within 60 days of the completion of the final closure.

8.6.9 Schedule for Closure

Final closure is expected to be initiated within 30 days of receipt of the final volume of hazardous wastes. If more time is required, ATK-Bacchus will make a request to the Executive Secretary. All hazardous wastes will be removed or treated within 90 days of: (1) plan approval, or (2) after receiving the final volume of hazardous waste, whichever comes latest. Final closure activities will be completed within 180 days of: (1) plan approval, or (2) after receiving the final volume of hazardous waste, whichever comes later.

8.6.10 Post-Closure Care

The closure plan described above anticipates that Ash Storage Pad will be clean closed and will not require post-closure care. If at the conclusion of the closure activities it is determined that Ash Storage Pad cannot be clean closed, ATK will develop an appropriate and applicable post-closure care plan for this unit. Any proposal for post-closure care will be developed in accordance with R315-8-7 and 8 UAC and 40 CFR 264, Subpart G and H, and submitted to the Executive Secretary for approval.

8.6.11 Closure Cost Estimate

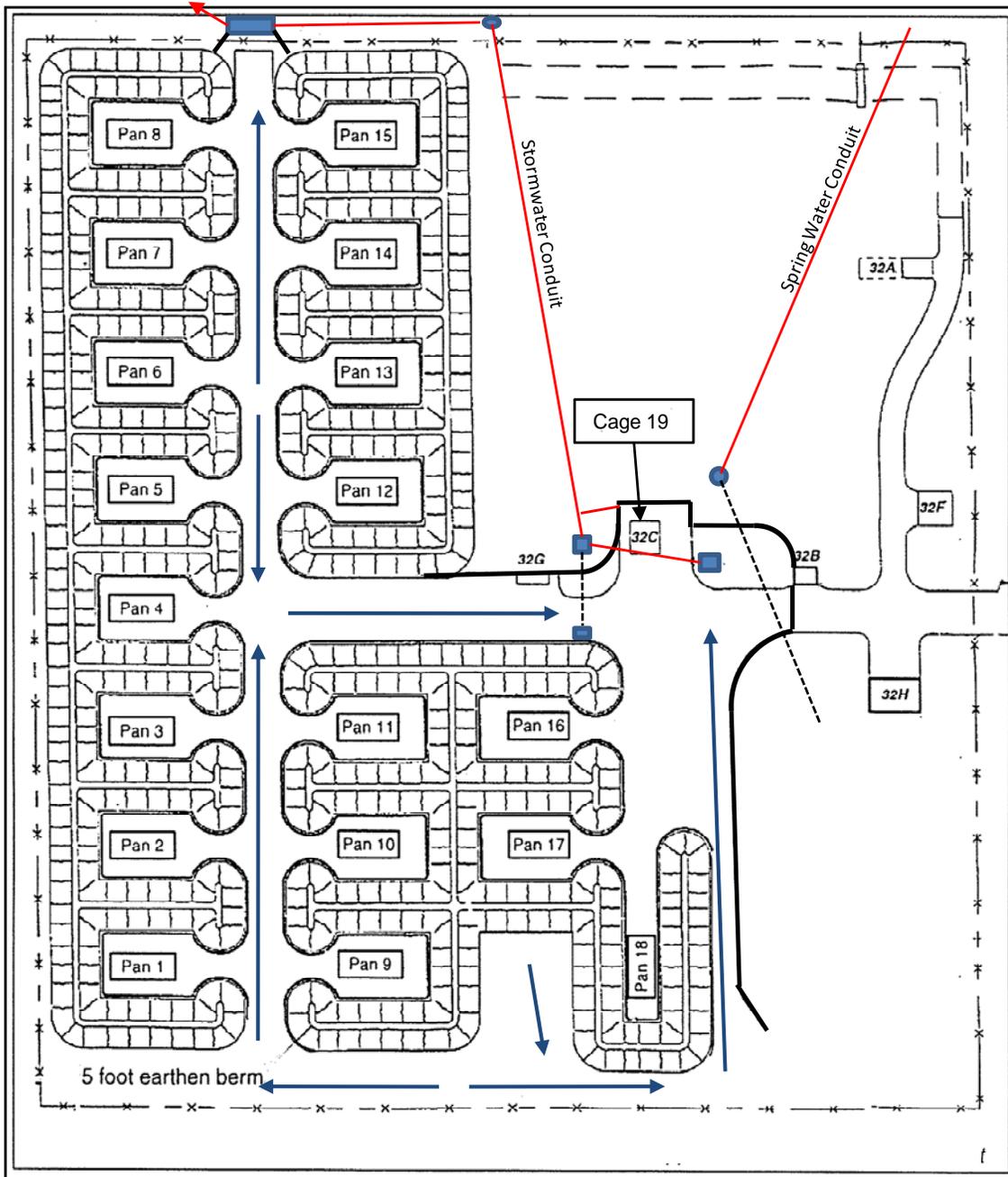
The cost estimate for the closure of Ash Storage Pad is presented in Table 8-5.

8.7 NIROP BURNING GROUNDS

The NIROP Burning Grounds are located on the Naval Industrial Reserve Ordnance Plant (NIROP) and are used by ATK to treat waste explosives and propellants generated on both NIROP and Plant 1 facilities. This unit was constructed in 1991 to replace the old Burning Grounds that was remediated as an interim corrective measure under RCRA guidance.

8.7.1 Site Description

The NIROP Burning Grounds is located approximately 1,650 ft west of State Hwy 111 and 1,450 ft south of 4100 South. These two roads are the west and north plant boundaries respectively. The NIROP Burning Grounds consists of about five acres and is enclosed by a chain-link fence (Figures 8-4 and 8-5). Approximately 1.5 acres of the Burning Grounds is covered by asphalt. The NIROP Burning Grounds consists of 18 burning pans, a burning cage, and service roadways. One burning pan is surrounded by a cage. The pans are approximately 50 ft apart and are separated by elevated 5-ft earthen berms to prevent an explosive event from propagating to another pan. The pans have a semi-circular bottom, a length of 25 ft and a width of 5 ft. The surface area of each pan is 125 square feet, with a volume of 245 cubic feet (9 cubic yards) per pan, or a total of 4,410 cubic feet (163 cubic yards) for all 18 pans (see Figure 8-6). The burning pans are filled with sand and contain no debris capable of producing fragments in the event of a detonation.



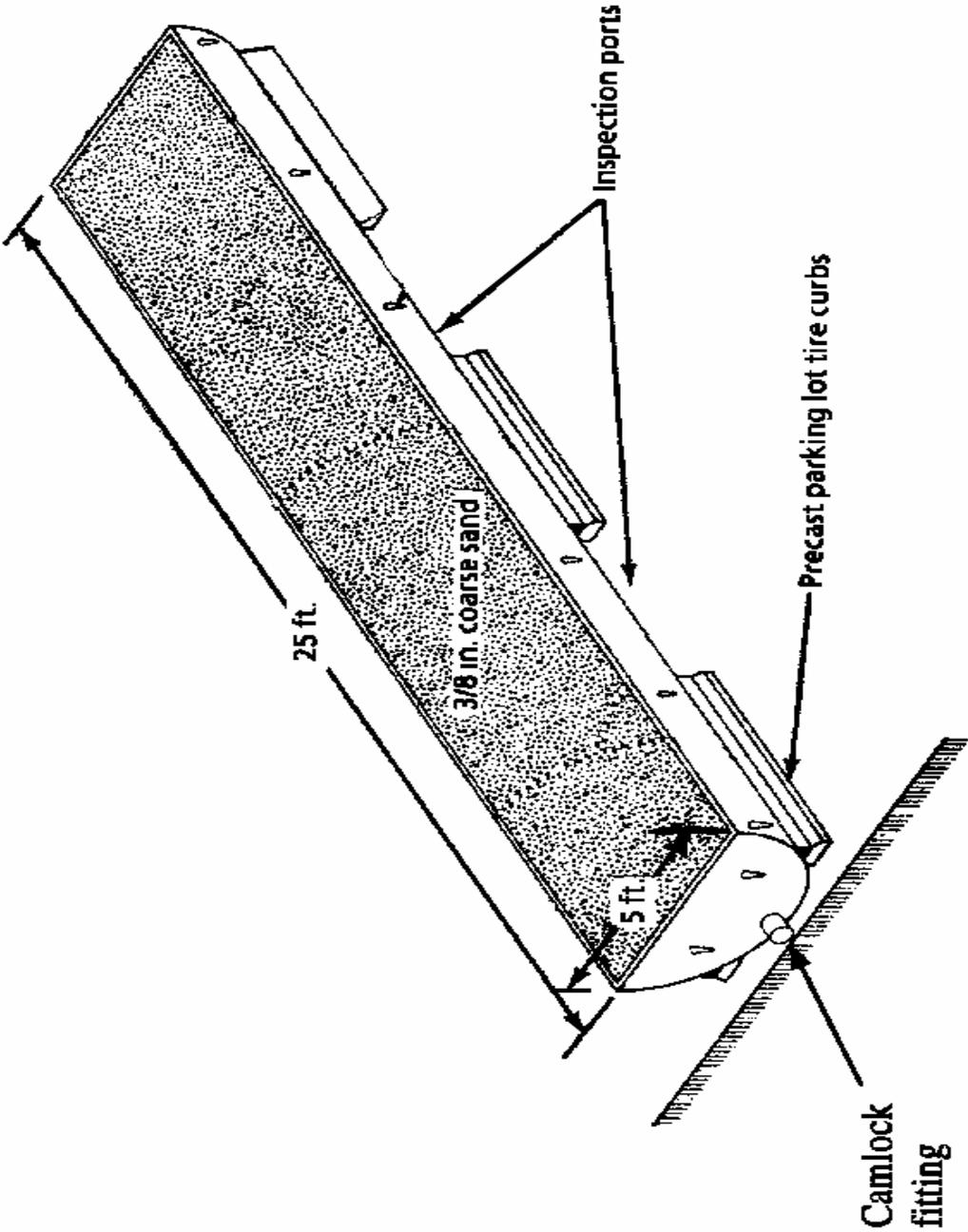
NIROP Burning Grounds Layout

Figure 8-4



NIROP Burning Grounds

Figure 8-5



Burn Pan
Figure 8-6

Each pan area is uniformly constructed with an asphalt surface approximately 30 ft by 40 ft. An asphalt curb approximately 8 inches high outlines each pan area. The asphalt is 3 inches thick overlying about 9 inches of road base. Within the fenced area of the NIROP Burning Grounds are several small material storage sheds that store the firing system relay panel, cleaning equipment, diesel, extra slum pots, and other necessary tools. The control room is located outside the chain-link fence to the east. Water lines are available in the NIROP Burning Grounds area for wetting the burning pans, if required, to ensure that no "hot spots" remain from the previous day's burn.

The explosive wastes burned at the site include: bulk propellants, slummed nitroglycerine (NG) wastes, and laboratory and other explosive wastes associated with testing and manufacturing operations at the facility. No complete rocket motors are burned or treated at the site.

According to a 1990 evaluation by the Navy to determine the quantity/distance requirements for the NIROP Burning Grounds, the Navy placed a maximum explosive limit of 4,500 pounds per burn. The maximum per-day treatment capacity is 4,500 pounds of explosives.

Stormwater from the asphalt area of the NIROP Burning Grounds is collected and treated at a facility (Building 22A) about 750 feet north of the NIROP Burning Grounds. The stormwater is conveyed and stored in a concrete vault, where it is treated using an ion exchange resin, then discharged through an outfall regulated by the Division of Water Quality under a Permit-by-Rule. The treatment system is designed to control, treat, and discharge stormwater runoff from the NIROP Burning Grounds during a 25-year 24-hour storm event.

8.7.2 Closure Plan

The closure plan detailed in this section was developed with the assumption that the NIROP Burning Grounds will be clean closed. The plan describes the procedures that will be used to clean, decontaminate, and verify closure of all applicable structures and equipment at the NIROP Burning Grounds, including the stormwater treatment system and how the closure standard will be established. Any change or amendment to this plan will be done in accordance with R315-8-7 UAC and 40 CFR 264.112(c).

8.7.3 Closure Performance Standard

The closure criteria for the pad and surrounding soil will be to clean close by both cleaning the unit and surrounding soil until they meet background conditions, or by meeting a clean closure equivalency as defined in R315-101-6(c)(1) UAC. If the pad can be clean closed, the pad may be used for other purposes, or may be demolished. No specific NIROP Burning Grounds post-closure monitoring is planned.

8.7.4 Operational History of Spills or Releases at the NIROP Burning Grounds

At the time this plan was written, a series of nine (9) small explosions involving mixtures of aluminum and ammonium perchlorate had occurred at the NIROP Burning Grounds between 2004 and 2006. Perchlorate contaminated soils were removed following these four events; the removed soils were confined to the top 8-inches. Soils with a perchlorate concentration of greater than 100 mg/kg were disposed of at an off-site location.

Five of the explosions did not require remediation of the dirt berms. In two of these events confirmation samples were collected. The perchlorate concentrations in these samples were less than 40 mg/kg, with most results less than 10 mg/kg. Such concentrations are believed to be representative for routine operations at the NIROP Burning Grounds.

Burn pans replaced in 1999 indicates that contamination in the burning pan sand will be at low levels and confined to the upper few inches. All pan sand will be sent to a secure landfill as a conservative measure.

In March 1995, as part of the acquisition of the Hercules Aerospace, Bacchus Works Facility by ATK a due diligence investigation, performed by Conestoga-Rovers, was performed for the entire Bacchus Works facility. The NIROP Burning Grounds was extensively sampled for organics, metals, and explosives. No contamination above the presumed actionable levels was identified. The RDX concentration in composite samples from each of the 18 pan areas was below 0.25 mg/kg in every case

8.7.5 Burning Pan Removal, Disposal, and Decontamination of Structure/Equipment

A decontamination area (decon area) will be designated or constructed to decontaminate large items such as the burning pans, as well as heavy equipment, such as loaders, backhoes, and dump trucks. The decon area will include a collection system and sump to collect decontamination water for treatment at the ATK wastewater treatment facility. All equipment will be decontaminated before exiting the NIROP Burning Grounds area.

Any physical debris along with the gravel in the pans will be collected for disposal. Leachate will be drained from the pans in the usual manner. Currently, leachate from the pans contains very low levels of explosives and is disposed offsite at an approved TSDF.

Pans, burn cages, and other metallic equipment will be dismantled and cleaned by repetitively steam cleaning and/or washing with high pressure water and scrub brushes. When the metal is visibly clean, it will be cut into appropriate sized pieces and treated in the ATK decontamination oven prior to being scrapped. Scrap metal will be considered "decontaminated" once it has been heat-treated in the decontamination oven, and will be sent to a metals recycler with no further testing. Asphalt, concrete curbs, and drains will be removed and sent to an industrial landfill for disposal. Authorized transporters and approved off-site disposal facilities will be used.

8.7.6 Soil Removal

As stated in Section 8.7.4, the soil at the NIROP Burning Grounds was extensively sampled for organics, metals, and explosives as part of a due diligence investigation in 1995. Additional sampling for perchlorate occurred in 2004 through 2006. Based on these results it is assumed that no soil will be contaminated above presumed action levels; therefore, it is anticipated that no significant soil removal will be required. However, small pockets of soil may be present that may require removal. For purposes of cost estimation, it was assumed that 20 cubic yards of soil will be removed.

In the event that a small amount of soil does require removal, removal will occur using appropriate equipment such as backhoes and scrapers, and sent to a special waste landfill for stabilization and disposal. Non-contaminated soil will be used as clean fill. Authorized transporters and approved off-site TSD facilities will be used.

8.7.7 Site Restoration

After closure, the original contour and vegetation of the site will be restored. Clean fill will be used, if required, to achieve the necessary contour. The area will be re-seeded with indigenous grasses.

Post-closure monitoring may be required if the groundwater has contaminants of concern above action levels. Existing monitoring wells currently monitor the NIROP Burning Grounds;

however, there is no indication at this time that additional post-closure monitoring will be required.

8.7.8 Stormwater Treatment System

The stormwater treatment facility will be cleaned along with the NIROP Burning Grounds closure. Stormwater from the Burning Grounds passes through two “water quality units.” The first unit removes gravel and debris associated with runoff from the asphalt, the second unit is designed as an oil-water separator, as well as an additional particle trap. At closure, the water quality units will be emptied and the water hauled to the system treatment vault. The two units will be decontaminated with a high pressure wash. All sediment will be collected and stored for characterization and subsequent disposal. Stormwater in the treatment vault will be processed through the existing system. The vault will be high pressure washed, with all rinse waters and sediment being stored for subsequent characterization and disposal. After all contaminated rinse waters have been run through the treatment system, the ion exchange resin will be removed from the vessels, characterized, and disposed in accordance with the applicable regulations at an approved landfill. The inside of the treatment building will be high pressure washed and all vessels and piping will be rinsed. Rinse waters generated during this operation will be collected, characterized, and disposed in accordance with the applicable regulations

8.7.9 Verification and QA/QC Samples

To demonstrate adequate decontamination, verification samples will be collected from the asphalt pad and specific soil locations. Table 8-6 (found in the *Tables* section following this chapter) identifies the number of verification and QA/QC samples ATK will collect during the closure of the NIROP Burning Grounds. Core samples of the asphalt will be collected at four locations. Locations for the cores will be decided based on the procedures described in Section 8.4. A total of 24 soil samples will be collected; 20 from the berms surrounding the burning pans based on criteria such as the general wind direction when burns were conducted, and 4 at the soil contact of the asphalt at the core locations. In addition to the verification samples, QA/QC samples will be collected during each day of verification sampling. During closure activities blanks will be collected daily and duplicate samples will be collected according to the bullet below:

- A field blank filled with de-ionized water will be exposed during sampling and analyzed for accidental or incidental contamination.
- A trip blank bottle will be filled with de-ionized water and carried with the decontamination/sampling crew to the Burning Grounds. The trip blank bottles shall be handled identically to the handling methods used for sample collection and subjected to the same analyses.
- One (1) blind duplicate verification sample will be collected for each ten (10) verification samples collected (rounded up to the next greatest multiple of 10).

Samples will be properly labeled, sealed, and sent to a Utah Certified Laboratory for testing. Samples will be handled under USEPA chain-of-custody and sample preservation protocols.

8.7.10 Closure Report and Certification

Upon completion of the closure a report will be submitted to the Executive Secretary certifying that the closure was accomplished in accordance with the approved plan. The report will include a summary of the operational history of the NIROP Burning Grounds, copies of the analytical results, copies of the QA/QC data, data validation report(s), copies of any manifests that accompanied off-site shipments of wastes, characterization of all cleanup waste or residues,

documentation that the closure of the NIROP Burning Grounds met the performance standard identified in Section 8.7.3, and a closure certification. A certification of closure according to 40 CFR 264.115 will be submitted by registered mail to the Executive Secretary within 60 days of the completion of the final closure.

8.7.11 Schedule for Closure

Final closure is expected to be initiated within 30 days of receipt of the final volume of hazardous wastes. If more time is required, ATK will make a request to the Executive Secretary.

All hazardous wastes will be removed or treated within 90 days of: (1) plan approval, or (2) after receiving the final volume of hazardous waste, whichever comes latest. Final closure activities will be completed within 180 days of: (1) plan approval, or (2) after receiving the final volume of hazardous waste, whichever comes later.

8.7.12 Post Closure Care

Soil remaining at the NIROP Burning Grounds will meet EPA Region 9 RSL action levels and will not require post-closure care. Groundwater under the NIROP Burning Grounds will probably continue to be contaminated following closure. Since most of the expected groundwater contamination will be from sources other than the NIROP Burning Grounds, monitoring will be conducted according Module V of the ATK Launch Systems Inc., Bacchus Facility – Plant 1 Permit.

8.7.13 Closure Cost Estimate

The estimated cost for the closure of the NIROP Burning Grounds is presented in Table 8-7.

8.8 SUMMARY OF CLOSURE COSTS

Table 8-8 summarizes the closure costs for the facilities described in this document. These costs represent maximum closure costs under any reasonable scenario. Costs are presented in 2009 dollars and are not escalated for future inflation.

TABLE 8-8 SUMMARY OF CLOSURE COSTS	
Description of Unit	Estimated Cost
ES-2 - Explosive/Hazardous Waste Storage Facility	\$60,741
Ash Storage Pad	\$11,079
NIROP Burning Grounds	\$349,545
TOTAL ESTIMATED COST	\$421,365

8.8.1 Changes in Closure Plans

If it becomes necessary to change, amend or modify the closure plans for any of the regulated units, a written request submitted to the Executive Secretary for a permit modification in accordance with R315-8-7 UAC and 40 CFR 264.112(c).

8.8.2 Closure Cost Updates

Closure costs will be updated annually using the Implicit Price Deflator (IPD) for the Gross Domestic Product, published annually on March 30th for the preceding year by the U.S. Department of Commerce Bureau of Economic Analysis. A letter will be submitted to the Executive Secretary within 60 days of the published IPD summarizing any increases.

Other necessary adjustments to the closure cost estimates resulting from changes in storage capacity, early closure of certain units, or other factors, will be made through a new engineering cost estimate for the applicable items and inflation updates for other items and explained in the annual cost update.

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RCRA Corrective Action Plan - OSWER Directive 9902.3-2A

TABLES

SAMPLE VERIFICATION & CLOSURE COSTS

TABLE 8-2 ES-2 SAMPLE VERIFICATION		
Area	Analytical Parameters	
	Volatile Organics	Explosives/Perchlorate
ES-2, Floor	2	2
ES-2, Walls	4	4
Field Blank	1	1
Trip Blank	1	--
Blind Duplicate	1	1

TABLE 8-3
ES-2 CLOSURE COST ESTIMATE

Item No.	Description	Means No./Source	Units	Est. Quan.	Unit Price	Total Price
1	Materials prep (CIH)	33-22-0111 x 2	hr	20	83.44	1,669
2	Materials prep (technician)	33-22-0112 x 2	hr	20	31.58	632
3	Construct temporary berm	17-03-9903	cy	5	54.20	271
4	Load drums	33-19-0103	ea	30	4.87	146
5	Haul to Clean Harbors	33-19-0242	truck-mi	200	5.94	1,188
6	Landfill disposal	33-19-7202 x 7	drum	30	952.00	28,560
7	State disposal fee	Utah	ton	10	28.00	280
8	Truck washout/decon	33-19-0311	ea	1	158.00	158
9	Steam cleaning, floors and walls	33-17-0812	sf	4,000	0.39	1,560
10	Wall wipe sample collection	Site crew	hr	8	65.00	520
11	Rinsate sample collection	Site crew	hr	8	65.00	520
12	Sample analyses, volatile organics	Chemtech-Ford	ea	9	250.00	2,250
13	Sample analyses, explosives	Chemtech-Ford	ea	8	210.00	1,680
SUBTOTAL						39,434
Inflation adjustment (see Means 2008 Heavy Construction Cost Data)				1.141		44,994
Misc. costs as a percent of the inflation-adjusted subtotal:						
Mob/demob				5	%	2,250
Engineering/permitting				10	%	4,499
DSHW oversight				10	%	4,499
Contingency				10	%	4,499
TOTAL ESTIMATED COST						\$ 60,741

Note: Disposal fee adjusted to be consistent with Bacchus Burning Grounds experience.

TABLE 8-4 ASH STORAGE PAD SAMPLE VERIFICATION		
Area	Analytical Parameters	
	Volatile Organics	Explosives/Perchlorate
Ash Storage Pad Soil	2	2
Ash Storage Pad Rinsate	1	1
Trip Blank	1	--
Field Blank	1	1
Blind Duplicate	1	1

TABLE 8-5
ASH STORAGE PAD CLOSURE COST ESTIMATE

Item No.	Description	Means No./Source	Units	Est. Quan.	Unit Price	Total Price
1	Site prep (CIH)	33-22-0111 x 2	hr	8	83.44	668
2	Site prep (technician)	33-22-0112 x 2	hr	8	31.58	253
3	Sweep area	33-22-0112 x 2	hr	8	31.58	253
4	Build temp berm (1'Hx2'Wx180'L)	17-03-9903	cy	7	54.20	379
5	Steam clean pad	33-17-0812	sf	2,025	0.39	790
6	Load rinsate/sweepings	33-19-0103	drum	5	4.87	24
7	Haul to Clean Harbors	33-19-0210	truck-mi	200	5.94	1,188
8	Landfill disposal (from pad decon)	33-19-7214	drum	5	145.00	725
9	State disposal fee	Utah	ton	1	28.00	28
10	Truck washout/decon	33-19-0311	ea	1	158.00	158
11	Concrete core samples, 3" dia.	16-01-0123 x 2	ea	1	50.60	51
12	Sample collection	33-22-0112 x 2	hr	4	31.58	126
13	Sample analyses, volatile organics	Chemtech-Ford	ea	6	250.00	1,500
14	Sample analyses, explosives	Chemtech-Ford	ea	5	210.00	1,050
SUBTOTAL						7,192
Inflation adjustment (see Means 2008 Heavy Construction Cost Data)				1.141		8,206
Misc. costs as a percent of the inflation-adjusted subtotal:						
Mob/demob				5	%	410
Engineering/permitting				10	%	821
DSHW oversight				10	%	821
Contingency				10	%	821
TOTAL ESTIMATED COST						\$ 11,079

TABLE 8-6 NIROP BURNING GROUNDS SAMPLE VERIFICATION				
Area	Analytical Procedure			
	Volatiles	Semi-Volatiles	Explosives/Perchlorate	Metals/Hg
Soil Samples	24	24	24	24
Asphalt (Core)	--	--	4	4
Field Blank	3	3	3	3
Trip Blank	3	--	--	--
Blind Duplicate	3	3	3	3

TABLE 8-7
NIROP BURNING GROUNDS CLOSURE COST ESTIMATE

Item No.	Description	Means No./Source	Units	Est. Quan.	Unit Price	Total Price
1	Site prep/confined space entry (CIH)	33-22-0111 x 2	hr	80	83.44	6,675
2	Site prep (technician)	33-22-0112 x 2	hr	40	50.96	2,038
3	Empty pans, spoil to side	17-03-0212	cy	163	33.88	5,522
4	Excavate contaminated soil	17-03-0231	hr	10	105.63	1,056
5	Load sand and soil	17-03-0222	hr	20	68.13	1,363
6	Haul sand & soil to Clean Harbors	33-19-0220	truck-mi	2,400	2.75	6,600
7	Landfill disposal, sand and soil	33-19-7214	ton	250	169.45	42,363
8	State disposal fee, sand and soil	Utah	ton	250	32.50	8,125
9	Steam clean pans	33-17-0812	sf	2,250	0.39	878
10	Load rinsate	33-19-0103	drum	5	4.87	24
11	Haul rinsate to Clean Harbors	33-19-0210	truck-mi	200	2.32	464
12	Landfill disposal, rinsate	33-19-7214	drum	5	145.00	725
13	State disposal fee, rinsate	Utah	ton	1	28.00	28
14	Demolish pans	17-02-0105	cf	4,410	0.14	617
15	Demolish burn cages/buildings	17-02-0105	cf	29,360	0.14	4,110
16	Load and haul pan/bldg debris	17-01-0705	cy	1,090	4.13	4,502
17	Decon oven labor	Site crew	hr	180	65.00	11,700
18	Decon oven supervision	Site supervisor	hr	80	80.00	6,400
19	Asphalt removal (83,200 sf x 3")	17-02-0202	cy	770	23.29	17,933
20	Load asphalt	17-03-0222	hr	20	68.13	1,363
21	Haul asphalt to Pacific West	33-19-0205	truck-mi	3,900	1.65	6,435
22	Asphalt disposal	Pacific West	ton	1,04	23.00	23,920
23	Empty WQU water into tanker truck	33-19-0101	ea	1	591.25	591
24	Steam clean WQU	33-17-0804	sf	630	1.07	674
25	Haul/unload WQU water at 22A basin	33-19-0111	hr	4	56.50	226
26	Pump backwash water to 22A basin	33-19-0101	ea	1	591.25	591
27	Steam clean backwash vault	33-17-0804	sf	700	1.07	749
28	Treat water in 22A basin	--	No charge - use in-place treatment equip			0
29	Steam clean 22A basin	33-17-0804	sf	3,800	1.07	4,066
30	Remove sed from 22A basin	17-03-0213	cy	5	45.17	226
31	Load sediment onto truck	33-19-0102 x 5	cy	5	14.05	70
32	Vacuum resin from vessels	33-19-0111	hr	8	56.50	452
33	Resin removal labor	33-22-0112 x 2	hr	8	50.96	408
34	Load resin onto truck	33-19-0102 x 5	cy	5	14.05	70
35	Haul sed and resin to Clean Harbors	33-19-0210	truck-mi	200	2.32	464
36	Landfill disposal, sed and resin	33-19-7214	ton	10	169.45	1,695
37	State disposal fee, sed and resin	Utah	ton	10	32.50	325
38	Remove equip from Bldg 22A	33-22-0112 x 2	hr	120	50.96	6,115
39	Steam clean Bldg 22A	33-17-0812	sf	230	0.39	90
40	Load rinsate	33-19-0103	drum	2	4.87	10
41	Haul rinsate to Clean Harbors	33-19-0210	truck-mi	200	2.32	464
42	Landfill disposal, rinsate	33-19-7214	drum	2	145.00	290
43	State disposal fee, rinsate	Utah	ton	1	32.50	33
44	Sample collection	Site crew	hr	32	65.00	2,080

TABLE 8-7
NIROP BURNING GROUNDS CLOSURE COST ESTIMATE

Item No.	Description	Means No./Source	Units	Est. Quan.	Unit Price	Total Price
45	Sample analyses, metals	Chemtech-Ford	ea	40	210.00	8,400
46	Sample analyses, explosives	Chemtech-Ford	ea	40	210.00	8,400
47	Sample analyses, volatiles	Chemtech-Ford	ea	40	250.00	10,000
48	Sample analyses, semivolatiles	Chemtech-Ford	ea	40	390.00	15,600
49	Site grading	17-03-0103	sy	9,300	0.98	9,114
50	Hydroseeding	18-05-0401	acre	5	576.39	2,882
SUBTOTAL						226,926
Inflation adjustment (see Means 2008 Heavy Construction Cost Data)				1.141		258,922
Misc. costs as a percent of the inflation-adjusted subtotal:						
	Mob/demob			5	%	12,946
	Engineering/permitting			10	%	25,892
	DSHW oversight			10	%	25,892
	Contingency			10	%	25,892
TOTAL ESTIMATED COST						349,545