

Business Case Analysis: Costs of Laundry Services

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14. ABSTRACT For thirteen years, William Beaumont Army Medical Center (WBAMC) has been receiving laundry support from UNICOR, the Federal Prison Industries Inc. Recently, problems with UNICOR's prices, cleanliness of finished products and quality of services have been identified by the hospital's Logistics Division and Infection Control offices. A business case analysis was conducted to research these issues and to explore an alternative laundry source. Two scenarios were analyzed: remain with UNICOR or contract with a commercial company. As a result of the study, it was found that UNICOR violated healthcare infection control standards due to facility deficiencies. The corporation also lacked transportation services and their laundering process reduced the quality of finished products. Financially, it has been costing the hospital more than twice what it would cost to contract with a private company. A \$1.48M cost savings has been projected over the next five years if WBAMC withdraws from its agreement with UNICOR and contracts with a local private company.					
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## Abstract

For thirteen years, William Beaumont Army Medical Center (WBAMC) has been receiving laundry support from UNICOR, the Federal Prison Industries Inc. Recently, problems with UNICOR's prices, cleanliness of finished products and quality of services have been identified by the hospital's Logistics Division and Infection Control offices. A business case analysis was conducted to research these issues and to explore an alternative laundry source. Two scenarios were analyzed: remain with UNICOR or contract with a commercial company. As a result of the study, it was found that UNICOR violated healthcare infection control standards due to facility deficiencies. The corporation also lacked transportation services and their laundering process reduced the quality of finished products. Financially, it has been costing the hospital more than twice what it would cost to contract with a private company. A \$1.48M cost savings has been projected over the next five years if WBAMC withdraws from its agreement with UNICOR and contracts with a local private company.

Disclosure

In accordance with Army Regulation 360-1 Section 6-8.C.(2), dated September 15, 2000, the views expressed in this document are those of the author and do not reflect the official policy or position of the Department of the Army, Department of Defense, or the U.S. Government.

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## Introduction

The purpose of this business case analysis is to (a) study UNICOR's laundry operations in support of William Beaumont Army Medical Center (WBAMC) (b) compare UNICOR's processes and costs to national and local standards and (c) provide a recommendation to the hospital governance on whether to continue the laundry program with UNICOR or outsource the program to a commercial (private) company. UNICOR, a wholly-owned corporation of the United States Government, is the trademark name for the Federal Prison Industries, Inc. Headquartered in Washington, D.C., the corporation operates 106 factories and employs more than 19,000 inmates confined within the Federal Bureau of Prisons to produce over 80 goods and services for sale to the federal government (FPI General Overview FAQ, n.d.).

For over ten years, UNICOR has operated a laundry plant on Fort Bliss and provided laundry and sewing services to organizations supported by the Fort Bliss Garrison Command including WBAMC.<sup>1</sup> Hospital linens such as bed sheets, surgical scrubs and patient gowns have been washed, dried and packaged by the inmates in accordance with a memorandum of agreement signed in 1993. Recently, problems have surfaced with UNICOR and its ability to support the hospital's laundry and infection control requirements. Issues such as the lack of transportation support,

hours of operations and textile cleanliness were reported to UNICOR by the hospital's Logistics Division and Infection Control offices. In light of this, UNICOR has not yet taken the necessary measures to resolve these issues.

#### *Background on the Study*

*William Beaumont Army Medical Center.* Located at Fort Bliss, Texas, WBAMC is a 104 bed hospital that provides comprehensive medical and surgical care to approximately 64,000 eligible beneficiaries. This includes active duty, military retirees and their family members. The hospital, as a major teaching institution for the U.S. Army Medical Command (MEDCOM), also provides a variety of didactic and resident programs for its students: one Anesthesia Nursing, one Perioperative Nursing, four Graduate Medical Education (GME) and 11 enlisted Military Occupational Specialties (MOS). WBAMC supports this diverse population of beneficiaries and students with a staff of 929 military and 1,435 civil service, contract and volunteer employees (C.A. Davis, personal communication, November 17, 2005).

The mission of WBAMC is to "provide comprehensive, cost effective and customer focused healthcare as part of a fully integrated health system for the greater Ft. Bliss community while providing combat-ready Soldiers during peace and war."

This concept is further stratified in its vision to "provide the very best in federal healthcare in support of the nation during peace and war" (C.A. Davis, personal communication, November 17, 2005).

*WBAMC Linen Management Section.* The Linen Management Section is organized under the Environmental Services Branch, which is responsible for housekeeping and medical textile care services (see Appendix A for organizational structure). Located on the first floor of the hospital where it stores, distributes and conducts administrative functions, the Linen Management Section is charged with providing linen, textile repair and transportation support to its customers. This includes WBAMC, the Soldier Family Medical Clinic (SFMC) on Fort Bliss and McAfee Army Health Clinic (MAHC) at White Sands Missile Range in New Mexico. In fiscal year (FY) 2005, the section was authorized to employ eight civil servants to perform these tasks: one supervisor, one motor-vehicle-operator, one sewing-machine-operator and five laundry workers (U.S. Army Force Management Support Agency, 2005). These laundry workers are primarily responsible for linen distribution and retrieval within the hospital since WBAMC has no on-premises laundry (i.e., in-house). The actual laundering is provided by UNICOR which is located four miles from the hospital on Fort Bliss.

*Federal Prison Industries, Inc.* UNICOR (a **Unique Corporation**) was established by Congress in June 1934. Its mission is to (a) employ and provide job skills training to inmates confined within the Federal Bureau of Prisons (b) produce goods and services for sale to the federal government and (c) operate in a self-sustaining manner with minimal impact to private businesses (FPI General Overview FAQ, n.d.). Goods and services offered by the corporation include but are not limited to clothing and textiles, electronics, office furniture and laundry services. As for the latter, UNICOR provides laundry services at only three locations: Eglin Air Force Base, Maxwell Air Force Base and Fort Bliss (Laundry Services, n.d.).

UNICOR, through a memorandum of agreement with the Fort Bliss Garrison Command, is to provide laundry and sewing services to organizations supported by the command. The memorandum of agreement, which is discussed in more detail in the subsequent sections, outlines the two parties' responsibilities and scope of work. Last year, 41 organizations from various agencies (e.g., Department of Defense and Veterans Administration) and countries (e.g., Germany and Japan) associated with Fort Bliss utilized UNICOR's services. Of these organizations, WBAMC accounted for 65% of the laundry services

provided by UNICOR (see Appendix B for organizations serviced by UNICOR).

UNICOR also supplements its business with the Fort Bliss Garrison Command by providing textile cleaning, sewing and boot shining services to authorized patrons (i.e., active duty, military retirees and their family members). However, these over-the-counter transactions are not within the purview of the agreement between the two parties because appropriated funds may not be used to subsidize or defray the costs of services provided to individual consumers (Army Regulation [AR] 210-130, 2005). Therefore, Fort Bliss Garrison Command will neither direct nor financially support UNICOR's dealings with these patrons. The command is only concerned with the corporation's ability to support its own organizations (J.A. Yroz, personal communication, November 9, 2005).

*Fort Bliss Garrison Command.* Three directorates from the Fort Bliss Garrison Command responsible for overseeing UNICOR's operations are the Directorate of Public Works, the Directorate of Logistics and the Resource Management Office. The Directorate of Public Works owns the laundry facility from which UNICOR operates and any upgrades or modifications to this facility must be approved by them. The Directorate of Logistics is responsible for monitoring and evaluating UNICOR's performance as prescribed

in the agreement. This directorate also serves as the Contracting Officer Representative (COR). The Fort Bliss Resource Management Office formulates, coordinates and maintains the agreement as well as paying UNICOR for its laundry and sewing services (I. Reed, personal communication, December 28, 2005). As UNICOR's largest customer, WBAMC confers with the Directorate of Logistics and Resource Management Office to provide input on the memorandum's verbiage (E. Macias, personal communication, December 28, 2005).

*Memorandum of agreement & payment method.* Representatives from Fort Bliss and UNICOR signed a memorandum of agreement in March 1993 that outlined each federal agency's responsibilities and scope of service to include laundry services to WBAMC. This agreement is still used today as no updates have taken place since 1993 except for a price modification in 2000 (I. Reed, personal communication, December 21, 2005). Key services UNICOR and WBAMC agreed to at the time were the following:

1. Laundry - UNICOR will wash, dry and prepare for pick-up the hospital linen within 24 hours of drop-off, except for weekends. Physician and laboratory smocks will be available within 48 hours of drop-off, except for weekends.

2. Transportation - WBAMC will provide inter-facility transportation support.

3. Infection Control Inspections - WBAMC will conduct periodic, infection control inspections of the laundry facility to ensure compliance with the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) standards.

4. Hours of Operations - UNICOR will operate Monday through Friday from 0730 to 1530 hours, except for legal public holidays.<sup>2</sup>

Payments to UNICOR are based on the amount and type of linen cleaned as per the agreement (see Appendix C for price schedule). Payments are not based on weight. The Fort Bliss Resource Management Office pays UNICOR for its services and subsequently, WBAMC reimburses the Resource Management Office for its share of the bill. In FY 2005, the hospital reimbursed Fort Bliss \$568,012 for laundry services it received from UNICOR.

#### *Conditions that Prompted the Study*

*UNICOR's services.* This business case was initiated due to problems with UNICOR's services identified by the hospital's Logistics Division in 2004 and 2005. In early 2004, unexplained shortages of hospital linen directly affected the Linen Management Section's ability to support the medical staff and patients. The section could not account for the shortages and determined that UNICOR was part of the problem (K.A. Parkin, personal communication, December 6, 2005). The linen supervisor

at the time believed that some of the medical textiles were being stolen by prisoners as bartering tools for cigarettes or other material. In past years, WBAMC marked linens have been seen in El Paso, Texas and Juarez, Mexico (E. Perches, personal communication, October 14, 2005). The Linen Management Section, though, was unable to definitively confirm the exact origin of the shortages. Then, in August to September of 2004, UNICOR was closed for approximately three weeks due to facility asbestos problems. The hospital incurred additional expenses from having to temporarily contract for laundry support with Supreme Laundry & Cleaners, a local company in El Paso (A. Borrego, personal communication, October 21, 2005).

In view of the mounting deficiencies with UNICOR's performance and with the antiquated memorandum of agreement, the Logistics Division notified UNICOR and the Fort Bliss Resource Management Office in June 2005 of the hospital's intent to withdraw from the agreement. Five reasons noted on the unofficial memorandum were (a) occasional closure without warning, (b) closure on the last Friday of every month, (c) lack of seven day support, (d) desire to be charged by pounds not pieces and (e) the lack of transportation support (A. Borrego, personal communication, October 21, 2005).<sup>3,4</sup> In June and August of 2005, representatives from WBAMC, UNICOR and the Fort Bliss

Garrison Command held meetings to resolve these issues. However, for unknown reasons, the Logistics Division did not send a representative to these meetings. Only the contracting officer from the Great Plains Regional Medical Command (GPRMC) assigned to the hospital and a budget analyst from WBAMC Resource Management Division represented the hospital at the meetings (K.A. Parkin, personal communication, December 6, 2005). The lack of representation from the Logistics Division caused these problems to be unresolvable and consequently, the notice of withdrawal did not materialize into any further action.

The primary reason the notice fell through was because the Logistics Division did not conduct a benefits-costs analysis on UNICOR. A study was needed before a decision from the hospital governance could be made on whether or not to withdraw from the agreement (M.E. Garr, personal communication, October 28, 2005). This was particularly true when leaders from Fort Bliss and WBAMC, involved with the laundry operations, assumed that UNICOR provided the lowest prices because of their low overhead costs; inmates are paid \$0.23 to \$1.15 per hour and double for Saturdays and federal holidays (E. Maestas, personal communication, January 5, 2006).

*Infection control deficiencies.* The hospital's infection control nurse had identified infection control problems with the

laundry facility on past inspections. The nurse's chief concern was the amount of dust and dirt in the building (L.B. McNicol, personal communication, December 7, 2005). Structurally, the exterior walls of the wooden building have transparent gaps and breaks which allow the dust and dirt from the El Paso desert environment to enter areas where hospital linen is cleaned. Within the building, physical barriers or walls are not utilized to separate soiled linen from clean linen areas. During the summers, the windows and doors are opened to help cool the building since there is no heating, ventilation or air-conditioning (HVAC) system. These external and internal deficiencies severely hamper the infection control measures required of UNICOR to protect the hospital linen from contamination. At present, UNICOR is not compliant with the Centers for Disease Control and Prevention (CDC) or JCAHO's infection control standards according to the nurse (L.B. McNicol, personal communication, December 7, 2005).

*UNICOR's waiver to operate on Fort Bliss.* In an effort to save money, Headquarters Department of the Army (HQDA) in 1999 directed all laundry and dry cleaning operations be privatized or outsourced to a non-government firm by 2002 (AR 210-130, 2005). In response to this directive, the Fort Bliss Garrison Command requested and received a five year waiver, which expires

in April 2006, for UNICOR to continue operations on Fort Bliss. Studies conducted at the time by the command showed that it was more cost-effective to stay with UNICOR than to outsource its laundry operations (J.A. Yroz, personal communication, November 9, 2005).

In light of the April 2006 expiration, the Fort Bliss Garrison Command has already submitted a request for another five year waiver to HQDA. The justification behind this request to remain with UNICOR was a projected cost savings of \$1.4 million (FY06 to FY10) compared to Supreme Laundry & Cleaners, a local company in El Paso (see Appendix D for projecting savings). Pending an answer from HQDA, the command received a one year extension on its current waiver. This study supports the need for the hospital to explore an alternative laundry source in case the new request is denied and laundry operations on Fort Bliss are shut down.

#### *Statement of the Problem or Question*

Given the background and conditions that prompted the study, this business case will focus on answering the following three questions: (a) are UNICOR's prices competitive to local firms, (b) what is the healthcare standard for cleaning linen and is UNICOR following these standards and (c) what is the impact to

Fort Bliss, UNICOR and others if the hospital withdraws from the memorandum of agreement?

#### *Purpose of the Business Case*

The business case is designed to provide the hospital governance with the necessary background information, financial projections and assessment of risks to support a decision on whether to continue the laundry program with UNICOR or outsource the program to a private company. A decision from the governance to outsource or not the program is expected sometime in the spring of 2006.

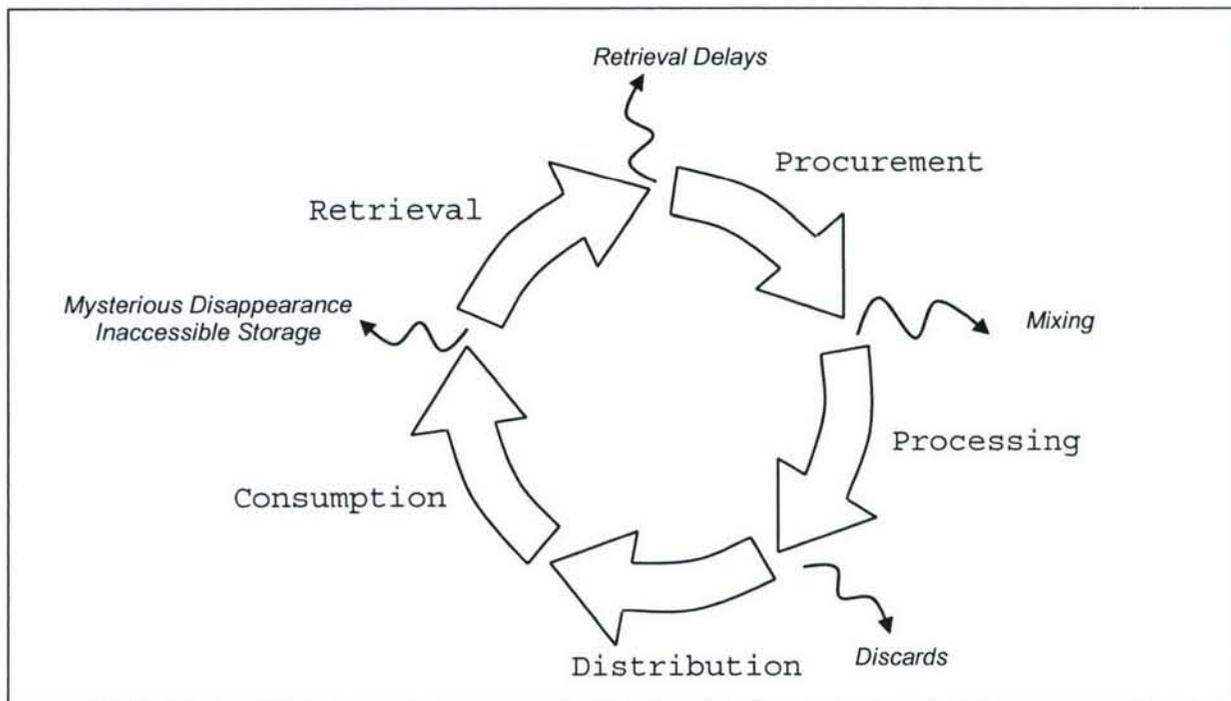
#### Literature Review

It is necessary to be familiar with all aspects of the laundry program because the hospital leadership, according to JCAHO (2006), is responsible for ensuring that "*services* [italics added] provided by consultation, agreements, or other agreements are provided *safely and effectively* [italics added]" (p. 268). Therefore, in the Literature Review section, an overview of the hospital's linen management program and the physical flow of linen will be discussed first in order to put into perspective the laundry's role in the program. Next, industry standards in laundry processes and costs will be reviewed. A comparison will then be made of these standards to

the findings at UNICOR in the Results and Business Impacts section.

#### *Linen Management Overview*

The Standard Textile's Linen Flow Model best illustrates the hospital's linen management program and the physical flow of linen (see Figure 1). Five key processes (or stages) identified in the model are Procurement, Processing, Distribution, Consumption and Retrieval (Kehoe, J., Kerley, F., & Gilbert, 2004).



*Figure 1. Standard Textile Linen Flow Model*

In the first stage, the Procurement process entails activities needed to replace lost, damaged or worn-out linen as well as activities to establish or increase linen supplies. The

goal at this stage is to ensure that the right items in the right quantities are on hand at all times (Kehoe et al., 2004). For the laundry program, an important factor in the Procurement process that must be considered is the product's weight and durability (i.e., how many times it can be washed). This factor affects the overall laundry costs, especially when commercial companies such as Supreme Laundry & Cleaners charge by pounds to clean hospital linen and not by pieces.

The next stage in the model is Processing: the "industry term for laundering or cleaning linen" (Kehoe et al., p. 4). Laundry services for healthcare organizations are generally provided by in-house, central or commercial (private) facilities.<sup>5</sup> The healthcare organization determines which service method to use after considering the benefits and costs of each. Regardless of the method chosen, the actual process of cleaning or washing the linen must still follow state and federal rules and guidelines. This is discussed in more detail in the next section.

After Processing, clean linen is then distributed to the consumers. The term Distribution is defined as "moving linen within a facility, typically from a linen staging area to consumer departments" (Kehoe et al., 2004, p. 3). The goal of Distribution is to provide to the consumers the "right product

at the right *time* in the right *quantity* at the right *place*" (Kehoe et al., p. 13). The laundry program plays a key role in this stage by ensuring soiled linen is promptly cleaned. Any delays in cleaning could result in consumer complaints and dissatisfaction with linen services, consequently forcing the organization to unnecessarily stock more items.

After Distribution, the linen then enters the Consumption stage in which the products are utilized by the patients and medical staff. How, when and where the linens are consumed is the main determining factor of linen costs (Kehoe et al., 2004). If not properly managed, consumers' behaviors such as the improper discarding of linen, placing clean linen into soiled (contaminated) linen and theft can increase overall costs. A good linen management program is needed to mitigate these behaviors and their impact on other linen processes (Kehoe et al.).

The last process in the linen flow model is Retrieval which is the collection of soiled linen from the clinics or collection areas. It is important that soiled linen is collected in a timely manner so that it can be cleaned and redistributed back to the consumers. Delays can permanently damage the linen if contaminants are not removed in time. A speedy Retrieval stage

will solicit a quicker laundry turn-around time (Kehoe et al., 2004).

Of the five processes identified in the model, only those linens in the Procurement stage are not considered to be actively circulating through the model. Also, the model is depicted as an open system to illustrate the fact that linen can flow out of the system through improper use (Kehoe et al., 2004). In light of this, it is obvious that a good hospital linen management program must be in place for the linen flow process to work efficiently. Although linen accounts for less than 1% of the hospital's total budget, it is still an integral part of the hospital's operations and a well managed linen program will allow the hospital leadership to focus more on patient care (Kehoe et al.).

#### *Processing Stage (Linen Flow Model)*

The goal of the Processing stage is to produce hygienically clean linen that is ready for consumer use (Kehoe et al., 2004). Although the term hygienically clean is not clearly defined, it does imply "...that items are free of microorganisms in quantities capable of causing illness" (Belkin, 2001, Definition of terms, ¶ 2). To achieve this goal, infection control measures should be taken along the three steps of Processing: sorting, laundering and packaging (Kehoe et al.).

*Sorting.* Linen can be sorted before or after washing. The laundry facility determines when to sort after considering the advantages and disadvantages of each method. The advantages to sorting before washing are (a) better protection for textile products and washing machines against objects left behind by consumers (e.g., needles and instruments) and (b) more flexibility to do custom washing based on soil type and linen mix (CDC, 2003). Some disadvantages are increased risks for workers to get sharp injuries and increased pay for the sorters (Otero, n.d.a). Alternatively, the advantages to sorting after washing are reduced exposure for the workers to infectious material in the linen and reduced potential for airborne microbial contamination in the laundry area (CDC). Some disadvantages for sorting after washing are shorter life expectancies for the textile products, no control of load (wash) classifications, and increased chemical and utility costs to reprocess heavy soiled linen (Otero). Regardless of when the laundry facility decides to sort, it is imperative that organizations still follow the Occupational Safety and Health Administration's (OSHA) Bloodborne Pathogen standards to protect employees exposed to potentially infectious materials in the linen.<sup>6</sup> These standards include but are not limited to employee training, accessibility to sharps disposals and written

institutional procedures to reduce the risks of exposure (Otero, n.d.b).

*Laundering.* Hygienically cleaned linen is the result of the mechanical, thermal and chemical activities inherent in the washing and drying process (CDC, 2003). Mechanically, washing activities such as diluting, agitating and rinsing promotes soil removal. The addition of detergents also assists to free the contaminant from the fabric and destroy the microscopic organisms. In hot water washing, temperatures of at least 160°F (71°C) for a minimum of 25 minutes provides for thermal bactericide. Lower temperatures of 71°F-77°F (22°C-25°C) are also effective when the cycling of the washer, wash formulas and the amount of bleach are closely monitored.<sup>7</sup> For additional safeguard, chlorine or oxygen-based bleach is added as a chemical bactericide. In the final stages of washing, sour (acids) are used in the last rinse cycle to help counteract any alkali, destroy microorganisms and reduce the risk of patient skin irritations from the alkali. The clean wet linen is then dried and ironed (if required). The high temperatures in the dryers and irons provide another measure to help destroy the microorganisms (CDC).

*Packaging.* Many methods can be used to functionally package the clean dry linen and reduce the potential for contamination.

One method is to place the linen in a cart lined with a clean disposable liner and then cover the cart to further protect the items from dirt and dust contamination (Otero, n.d.a). Another method is to wrap individual bundles of linen in clear plastic (CDC, 2003). Once functionally packaged, the linen is then transported to the hospital. The same truck may be used to transport the clean and soiled linens (collectively or separately) provided effective measures have been taken to protect the clean items from contamination (CDC).

#### *Infection Control Measures*

*Risks of infection.* "Although contaminated textiles...can be a source of substantial numbers of pathogenic microorganisms, reports of healthcare-associated diseases linked to contaminated fabrics are so few in number that the overall risk of disease transmission during the laundry process likely is *negligible* [italics added]" (CDC, 2003, p. 98). Therefore, infection control measures such as those identified in the Processing stage above are effective and should be continued to minimize the threat of disease transmission to patients and staff (CDC).

*Facility layout.* The physical layout of the laundry plant is another infection control measure that must be addressed when processing hospital linen. According to the Healthcare Laundry Accreditation Council (2006), the laundry facility should be

designed, equipped and ventilated in a manner that (a) minimizes environmental contamination and (b) promotes for the seamless production of hygienically clean textiles. To help protect the integrity of the processed textiles, soiled linen should be separated from clean linen by one or more methods including physical barriers, negative air pressure systems in the dirty (soiled) area or positive air systems in the clean area (Otero, n.d.b). The air pressure system helps to reduce aerosolized contaminated lint from contaminating the clean linen (CDC).<sup>8</sup> To ventilate the facility, a minimum of 10 air changes per hour for soiled areas and two air changes per hour for clean linen storage areas is recommended (AIA, 2001).

*Applicability.* The infection control measures described to this point apply to all laundry facilities including in-house, central and commercial facilities (CDC, 2003). JCAHO (2006) further recommends in its infection control chapter to incorporate the CDC guidelines as part of the hospital's infection prevention and control programs. For Army hospitals, the Linen Management Committee is responsible for ensuring that hospital textiles are cleaned to healthcare standards in accordance with applicable rules and guidelines (e.g., JCAHO and OSHA) (AR 40-61, 2005).

*Quality Assurance Program*

The quality assurance program helps to ensure that laundry facilities safely and effectively provide hygienically clean linens. The Environmental Services Branch, in Army hospitals, is required to "implement a quality assurance surveillance program, independent of the contractor's QC [quality control] program, to evaluate quality, quantity, and timeliness of performance in accordance with contract specifications" (AR 40-61, 2005, p. 43). Sodexo, the leading food and facilities management services company in North America, recommends that healthcare organizations inspect their contractor's facilities, equipment and operations (see appendix E for inspection checklist) (D. Roberson, personal communication, January 19, 2006). Furthermore, the Healthcare Laundry Accreditation Council (2006) advises organizations to periodically monitor their contractor's laundry processes (e.g., wash formula, temperature and cycle) to make certain that the standards set by the contractor and user have been met. One method that hospitals or contractors can use to evaluate this process is to send swatches of finished products to an independent laboratory such as the International Fabricare Institute for quality tests (G. Dow, personal communication, January 6, 2005).

*Trends in Laundry Services*

*U.S. Army Hospitals.* Army hospitals in 2005 outsourced 100% of their laundry functions according to the Environmental Services Program Management Office at Fort Sam Houston, Texas (see Appendix F for sources). Commercial contractors accounted for 47% of the outsourcing followed by Base Operations Support (32%) and the Veterans Administration (21%).<sup>9</sup> At this time, Army hospitals are expected to continue to outsource all of their laundry needs in accordance with the 1999 HQDA directive to privatize or outsource laundry and dry cleaning operations. The only exception will be Bassett Army Community Hospital in Fort Wainwright, Alaska. This hospital will have the first in-house laundry mission when construction on the new Bassett hospital is completed sometime in FY 2007. Currently, it receives laundry support from Fort Richardson, 360 miles south of Fort Wainwright (G. Stepman, personal communication, February 14, 2006).

*Civilian hospitals.* Civilian hospitals in 2003 outsourced 49.2% of its laundry functions according to Hospitals and Health Networks in their 13th Annual Contract Management Survey (Towne & Hoppszallern, 2003). This was only a 0.4% increase from the same survey conducted two years earlier ("Contract management survey", 2001). Laundry, though, still remains in the top five administrative (versus clinical) functions that hospitals

outsourced (Towne & Hoppszallern). Space limitations, lack of capital and the need to focus on hospital core services are a few reasons many hospitals have discontinued their in-house laundry functions and resorted to outsourcing ("Special report on laundry facilities", 2004).

*Benchmarks (cost)*

In Standard Textile's 2004 Performance Indicator report, the national average for laundry services from commercial contractors was 33¢ per pound. This price included labor, transportation, utilities, chemicals, et al. It did not include distribution and linen replacement costs. The averages for the West and Midwest regions were 32¢ to 33¢ per pound for all laundry types including in-house, central and commercial facilities (D. Kidder, personal communication, November 22, 2005). Locally, in El Paso, Las Palmas and Del Sol Regional Healthcare System owns and operates a central laundry facility at a cost of 22¢ to 26¢ per pound (P. Chavez, personal communication, December 15, 2005); Las Palmas and Del Sol are for-profit hospitals owned by the Hospital Corporation of America. In contrast, Thomason Hospital outsourced its laundry functions and paid Supreme Laundry & Cleaners 36¢ per pound for six days of laundry and transportation support (L. Roybal,

personal communication, January 4, 2006); Thomason is a 327 bed, not-for-profit county hospital.

For military hospitals, Supreme Laundry & Cleaners stated that they could provide WBAMC the same levels of service as Thomason for 49¢ per pound (G. Dow, personal communication, January 6, 2006). Similarly, Mission Linen Uniform of El Paso and American Linen Supply of Las Cruces both estimated 42¢ per pound (M. Villarreal & M. Layne, personal communications, January 10 & 16, 2006). Compared to Thomason Hospital, WBAMC's rates from the local contractors are notably higher. Several reasons for this include but are not limited to expected workload and federal contracting requirements. For instance, Supreme's rates are higher because the company expects to receive a lower volume of work from WBAMC (a 104 bed hospital) than Thomason (their largest customer).<sup>10</sup> Contractors normally provide better rates or discounts to hospitals that provide a higher volume of work to them. Additionally, the Federal Acquisition Regulation (FAR) requires non-government firms to pay certain wages and benefits to their employees when contracting with the federal government (K. Parkin, personal communication, January 17, 2006). Since Supreme only pays minimum wages and no benefits, the company states that they would have to increase their labor costs in order to comply with

the FAR: these costs would be passed onto WBAMC (G. Dow, personal communication, January 6, 2006). Nevertheless, Supreme's rate (i.e., 49¢) is comparable to what other Army hospitals were charged. Dwight D. Eisenhower Army Medical Center (DDEAMC) in Fort Gordon, Georgia paid its contractor 48¢ per pound for five days of laundry and transportation support (L. Brown, personal communication, December 13, 2005). DDEAMC is considered to be WBAMC's sister hospital since it has similar mission and support structures.

#### Methods and Assumptions

##### *Scenarios*

Two scenarios were reviewed for this business case. The first scenario looked at maintaining laundry services with UNICOR and the second scenario looked at outsourcing the laundry and transportation support. Also, the first scenario assumed that current business practices will remain in place over the analysis period (status quo) while the second scenario assumed that the hospital governance will implement this scenario as proposed. A third scenario to build an in-house laundry facility was initially considered but later ruled out in accordance with the 1999 HQDA directive to outsource or privatize the Army's laundry and dry cleaning operations.

*Data Source*

The projected financial benefits and costs were developed from a comparison of scenarios one and two over a five year period. To show net savings (or costs), a cash flow statement was created based on cost-per-pound prices (e.g., 44¢ per pound) and workload (i.e., pounds of linen cleaned). The following sources and data were used to build the base year (Year 0) in the statement:

1. UNICOR - Invoice statements, overtime expense, workload (soiled linen weights) and daily abstract reports in FY 2005.<sup>11</sup>

2. The U.S. General Services Administration Central Fleet Program - Lease and mileage fee rates for one 2 ½ ton truck that was leased by the Linen Management Section in FY 2005.

3. WBAMC Logistics Division - Actual miles driven for the leased truck in FY 2005.

4. WBAMC Resource Management Division - Labor costs including salary and benefits for the Linen Management Section's motor-vehicle-operator in FY 2004.<sup>12</sup>

5. Supreme Laundry, Mission Linen and American Linen - Costs for commercial (private) laundry and transportation support.<sup>13</sup>

*Scope of the Business Case*

*Time.* Financial data were utilized from the above mentioned sources to project cash outflows in FY 2007 to 2011 (Years 1 to 5). Also, annual net savings were based on the assumption of scenario two being approved by the hospital governance in March and implemented from April to September of 2006. The 180 day transition period will allow the Center for Healthcare Contracting Office (CHCC) at Fort Sam Houston the time to complete all contracting requirements prior to the effective date. Additionally, the transition will allow the Fort Bliss Directorate of Logistics, the Resource Management Office and UNICOR the time to conduct their own internal studies on the impact of WBAMC's withdrawal from the agreement (I. Reed, personal communication, February 6, 2006).

*Organizations.* Organizations directly affected by this business case were WBAMC, the Fort Bliss Garrison Command, UNICOR and commercial contractors. Indirectly, customers of UNICOR could be affected to some degree (e.g., higher prices) if WBAMC withdraws from the agreement. These customers include but are not limited to the Department of Veterans Affairs Health Care Center, Dental Clinic #3 on Fort Bliss and the over-the-counter consumers.

*Personnel and equipment.* The motor-vehicle-operator position, which has been temporarily filled by the hospital's laundry workers since May 2005, was not required in scenario two. The commercial contractor will provide the hospital with transportation support. Also, the Linen Management Section will return one leased truck to the U.S. General Services Administration (i.e., leasor) prior to implementation. No new equipment, automation or other start-up costs were required in either scenario.

*Laundry service and support.* Six days of laundry and transportation support to WBAMC and three days of support to the Soldier Family Medical Clinic were evaluated for scenarios one and two. Transportation support to McAfee Army Health Clinic at White Sands Missile Range in New Mexico was excluded from scenario two (see Major Assumptions section below). Additionally, this study did not evaluate textile repair, linen rental, linen replacement or distribution support as part of the laundry costs.

*Hospital textiles.* All textiles in the hospital were included in the business case except for curtains (drapes) from inpatient rooms and linen from the dining facility. Curtains (drapes) require dry cleaning services and UNICOR does not have this capability. Linens from the dining facility such as aprons, napkins and table skirts were also excluded because UNICOR

provides biweekly laundry and transportation support to the dining facility independent of the support it provides to the Linen Management Section.<sup>14</sup>

*Laundry inspections.* Two inspections were conducted on UNICOR's building and laundry operations in December 2005 (pre-inspection) and February 2006 (post-inspection). During the inspections, infection control measures and cleaning processes were evaluated to make certain that applicable rules and guidelines were being followed. Additionally, an inspection was conducted on two local companies so that a comparison could be made between their operations and those of UNICOR.

#### *Financial Metrics*

Cash flow estimates were developed for each year in the analysis period (Years 1 to 5) and summarized on a standard cash flow statement. Three financial metrics were used to assess the estimated cash flow values: net savings, cumulative net savings, and net present value. The net savings, given in dollars, represents annual cost avoidance of implementing scenario two over scenario one. The cumulative net savings is the total projected savings of scenario two over the five year analysis period. The net present value, given in dollars, represents the current value of all cash flows discounted at a rate of 4.8% (Office of Management and Budget, 2006).

*Financial Costs*

As shown in Figure 2, the required resources and expense items are summarized in the business case cost model.

RESOURCES	SCENARIO ONE (Years 1 to 5)	SCENARIO TWO (Years 1 to 5)
Services	<ul style="list-style-type: none"> <li>○ Laundry services (Monday - Friday)</li> <li>○ Overtime fees for Saturday support</li> </ul>	<ul style="list-style-type: none"> <li>○ Laundry services (Monday - Saturday)</li> </ul>
Equipment (WBAMC)	<ul style="list-style-type: none"> <li>○ Lease one truck</li> <li>○ Mileage fees</li> </ul>	<ul style="list-style-type: none"> <li>○ NA - Included in the services costs</li> </ul>
Personnel (WBAMC)	<ul style="list-style-type: none"> <li>○ Motor-vehicle-operator's salary</li> </ul>	<ul style="list-style-type: none"> <li>○ NA - Included in the services costs</li> </ul>

*Figure 2.* Business case cost model for scenarios one and two

Two key cost differences in the model are weekend and transportation support. Inclusive in the price of private firms are Monday through Saturday laundry and transportation support. Conversely, UNICOR does not provide transportation support. The corporation also charges overtime fees for Saturday services in addition to the costs of cleaning hospital linens.

*Cash Flow Statement: Cost-Per-Pound Calculation*

A key milestone of the financial cash flow statement was to show net savings (or costs) based on six days of laundry and transportation support. To accomplish this feat, WBAMC's laundry and transportation expenses were recalculated to cost-per-pound rates: the same measure used by commercial contractors. Given

the data sources and scope of the business case, the following actions were taken to compute this rate for the base year (Year 0) in scenario one (see Appendix G for calculations):

1. Service costs - WBAMC's laundry and transportation expenses were added to UNICOR's overtime fees. The transportation expense included one leased truck and driver.

2. Overpayment - Overpayments to Fort Bliss Resource Management Office were discovered during this study. The FY 2005 overpayment was added to the service costs above.<sup>15</sup>

3. Workload - An estimated 698,734 pounds of soiled linens were processed by UNICOR according to their FY 2005 workload report. The recorded weights were then converted to clean poundage (635,213) using a 10% clean to soil factor.<sup>16</sup>

4. Cost Per Clean Pound - Total costs were divided by total clean pounds to achieve the cost-per-pound rate. In FY 2005, WBAMC paid approximately 96¢ per pound for six days of support.

#### *Major Assumptions*

*Scenario one (cost-per-pound)*. Given the elements used to calculate the cost-per-pound rate for Year 0 (as shown in Appendix G), the following assumptions were made to project the rates for Years 1 to 5:

1. A 10% rate increase for hospital linen in Year 1: no further increases in Years 2 to 5.<sup>17</sup>

2. The hospital will continue to receive laundry services on Saturdays and UNICOR will apply the same overtime rates for the weekend support.<sup>18</sup>

3. The vehicle lease and mileage fee rates will increase at a rate of 2% and 7% per year.<sup>19</sup>

4. The motor-vehicle-operator position is permanently filled by September 2006.

5. The motor-vehicle-operator's salary will increase at a rate of 3% per year.

6. Overpayments to the Fort Bliss Resource Management Office will cease before Year 1.

7. Workload will remain unchanged (i.e., straight-line).<sup>20</sup>

*Scenario one (cash outflow)*. The following assumptions were made when developing the cash flow statement (see Appendix H for statement):

1. The cost-per-pound rates and workload, as shown in Appendix G, were valid.

2. A 10% rate increase for physician and laboratory smocks in Year 1: no further increases in Years 2 to 5.<sup>21</sup>

3. Workload for the smocks (in pieces) will remain unchanged.

*Scenario two (cash outflow)*. The following assumptions were made when projecting the cash outflows for Years 1 to 5 in the cash flow statement (see Appendix H for statement):

1. Transition will begin in April 2006 and be fully implemented by October 2006.
2. Contractor will provide laundry and transportation services six days a week to the hospital and three days a week to the Soldier Family Medical Clinic.
3. Costs are 44¢ per pound in Year 1; price will increase at a rate of 3% in Years 2 to 5.<sup>22</sup>
4. Costs are \$1.69 per physician and laboratory smock in Year 1; price will increase at a rate of 3% in Years 2 to 5.
5. Linen will be transported one day a week to McAfee Army Health Clinic by either the Property Management Branch or Materiel Branch (of Logistics Division).
6. UNICOR will continue to support the dining facility.
7. Contractor is compliant with applicable CDC and JCAHO infection control standards.

#### Results and Business Impacts

##### *Cost Savings and Pricing*

The cash outflows of scenarios one and two are summarized in Appendix H. In brief, implementing a new contract with a private company is projected to save the hospital about \$1.48M

dollars over the next five years. The cumulative net savings is based on a total expected cost of \$1.48 million minus \$2.96 million for UNICOR's costs. At a discounted rate of 4.8%, that savings represents a net present value (NPV) of \$1.29M dollars. This is a significant financial improvement over the business as usual (status quo) scenario.

An analysis of the \$1.48M savings reveals that the largest financial gain comes from UNICOR's excessive laundry and overtime pricing: an average of 83¢ per pound versus 46¢ (see Table 1). Even with the removal of WBAMC expenses, these rates are still considerably higher than local companies.

Table 1

*Total costs and average rates for FY07 to FY11*

	<u>Scenario one (a)</u>		<u>Scenario two (b)</u>		<u>Difference (b-a)</u>
	Costs	Ave Rate	Costs	Ave Rate	
UNICOR	(\$2,639,615) <sup>a</sup>	\$0.83	(\$1,460,990) <sup>b</sup>	\$0.46	\$1,178,625
WBAMC	(\$314,719) <sup>c</sup>	\$0.10	(\$0.00)	\$0.00	\$314,719
Total	(\$2,954,334)	\$0.93 <sup>d</sup>	(\$1,460,990)	\$0.46	\$1,493,344 <sup>e</sup>

Note. Total costs reflect Years 1 to 5. <sup>a</sup>Includes laundry costs (\$2,365,320) and overtime fees (\$274,295); excludes physician smocks. <sup>b</sup>Includes laundry costs only; excludes physician smocks. <sup>c</sup>Includes transportation costs (labor and truck). <sup>d</sup>Average rate based on total costs over the analysis period divided by total pounds (3,176,065) of clean linen. <sup>e</sup>Does not equal the \$1,832,941 shown in the cash flow statement due to rounding in UNICOR's price-per-pound calculations used in Appendix G and H.

Additional studies on UNICOR's laundry and overtime price schedule, as shown in Appendix C, also supported the finding that their prices were too high (see Appendix I for analysis). In that study, the laundry rates (given in pieces) were recalculated to pounds for the hospital's top 15 textiles (which accounted for 99% of the hospital's total volume). Of the 15 items, only four were priced below UNICOR's competitors. This was based on the assumption that the data and local prices were valid. As for the overtime fees, it was discovered that a 100% mark-up was concealed in these prices for profit (I. Reed, personal communication, January 24, 2006). The unwarranted margin accounted for about 5% of UNICOR's total costs. Consequently, UNICOR's price inequities combined with WBAMC's expenses resulted in scenario one's overall costs being more than twice that of scenario two.

#### *Infection Control (Facility)*

An inspection of the laundry facility in December 2005 and again in February 2006 validated the infection control nurse's concerns. Dust and dirt were found throughout the wooden building due to external and internal structural deficiencies as described in the Conditions that Prompted the Study section. However, the degree to which hospital linens were being contaminated from the dust and dirt was not known. Even under

ideal conditions, it is difficult to define what is considered hygienically cleaned linen (Belkin, 2001). What is clear is that the potential for contamination will be drastically lower if the structural deficiencies are corrected to the laundry plant design standards, as referenced in the Literature Review section. Unfortunately, no near or long term plans are being considered at this time to correct these shortcomings according to the Fort Bliss master planner (C. Jones, personal communication, March 23, 2006). The primary reason for this is because Fort Bliss Garrison Command lacks the capital to upgrade the antiquated building, which was built in 1941, to today's healthcare laundry standards (V. Eslinger, personal communication, January 25, 2006).

A similar inspection of two local laundry companies, Supreme Laundry and Mission Linen, found that both laundry facilities were in greater compliance with CDC standards than UNICOR. Unlike UNICOR's wooden building, the commercial buildings were built from bricks and cement. Structurally, no transparent gaps or breaks were found along the exterior walls and internally, physical barriers (i.e., walls) were utilized to separate soiled linen from clean linen areas. These basic infection control measures help to reduce the potential for environmental contamination. In terms of patient safety and

healthcare accreditation requirements (i.e., JCAHO), contracting with a private firm is a significant infection control improvement over UNICOR.

#### *Laundry Services*

Other notable benefits of contracting with a private firm would include better Saturday services and quality of finished products. On Saturdays, contractors provide the full spectrum of laundry services including cleaning, drying and packaging. In contrast, UNICOR only dries and packages unfinished products left from Friday; this has forced the hospital to unnecessarily stock more linen to compensate for the longer turn-around times experienced on weekends and holidays. As for the quality of the finished products, contractors pre-sort and custom wash hospital linen in order to improve the quality and longevity of the products (e.g., fabric color and strength). Additionally, contractors maintain a quality control program to make certain that their laundering processes meet healthcare requirements. UNICOR, on the other hand, uses only one wash formula, post-sorts the linen and lacks a quality control program.

#### *Laundry Waiver for UNICOR*

Part of Fort Bliss Garrison Command's justification for another five year waiver was a projected cost savings of \$1.4 million to remain with UNICOR versus outsourcing to Supreme

Laundry & Cleaners (see Appendix D). Contrary to the \$1.4 million savings, a separate study showed instead a net loss of \$0.8 million (see Appendix J). This is based on two major errors found in the command's original analysis. First, a 15% transportation fee was added onto Supreme Laundry & Cleaners total costs despite the fact their prices already included this expense. Second, Supreme Laundry & Cleaners' rates (given in pieces for bulk textiles) were only ballpark estimates according to Supreme's general manager (G. Dow, personal communication, April 12, 2006). Unlike UNICOR, Supreme charges by pounds and not pieces. So, if the command removed the 15% transportation costs and calculated the bulk items by Supreme's actual pricing (in pounds), a net loss would have resulted in staying with UNICOR and not a savings. These findings along with the infection control shortfalls would have shut down UNICOR.

#### Sensitivities, Risks and Contingencies

##### *Sensitivity Analysis (Cash Flow Statement)*

The \$1.48M cumulative net savings was primarily based on the assumptions that workload remained a constant 635,213 pounds and contractors' prices were 44¢ to 48¢ per pound during the analysis period. Since these values are subject to change (given the uncertainties of some assumptions), there is an inherent risk that the projected savings will differ from actual savings.

For instance, a 50% increase in workload will save the hospital an additional 33% (\$2.23M) while a 50% increase to contractors' prices will decrease the savings to \$0.71 million (see Figure 3 for graph and Appendix K for analysis). To ensure that the \$1.48M cost savings is achieved, either workload will have to increase or prices will have to decrease. Fortunately, Figure 3 shows a positive net savings at both the high and low ends of the sensitivity analysis.

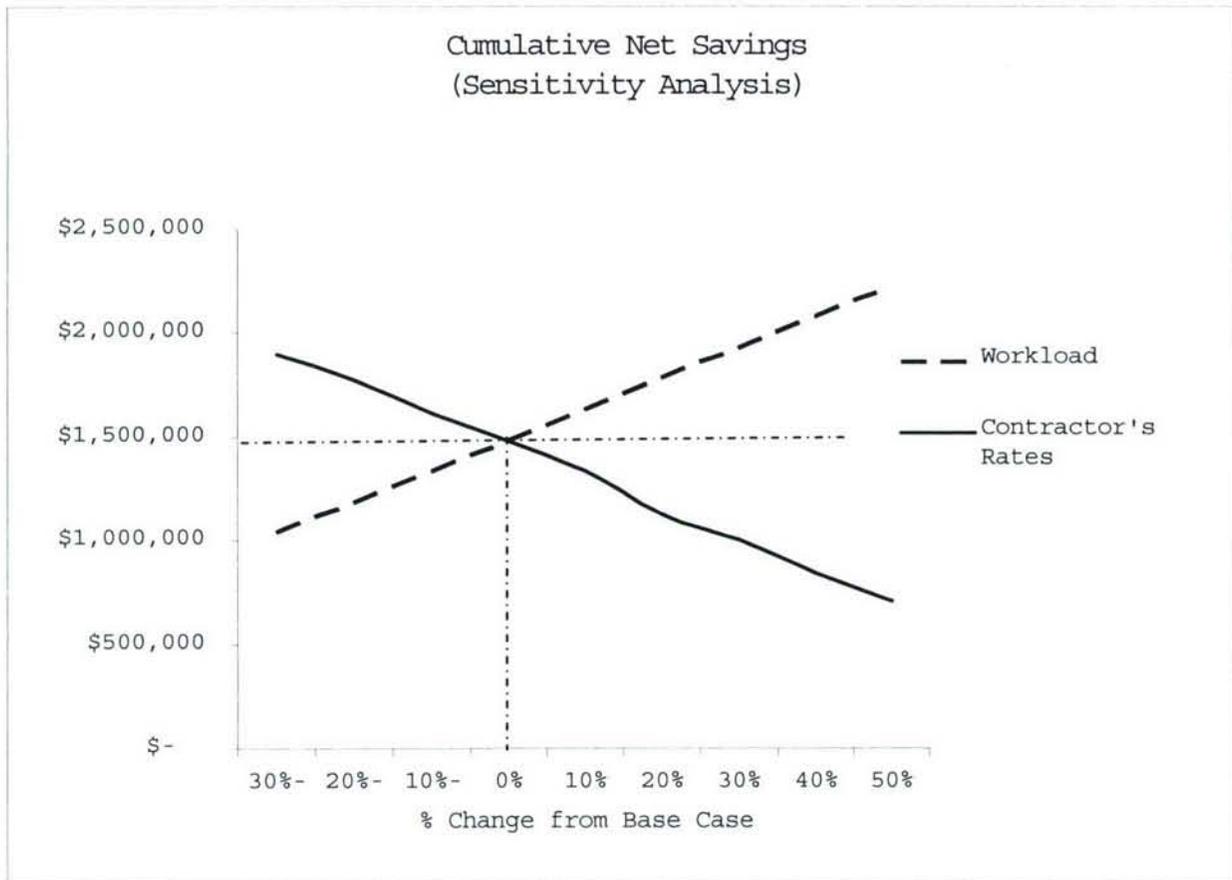


Figure 3. Sensitivity analysis in workload and price.

Although there is a multitude of possibilities to the projected savings (as shown in the sensitivity analysis), it is unlikely that the actual savings will fall below \$1.48M dollars. Instead, this study expects more financial gains due to (a) WBAMC's growing beneficiary population and (b) assurance in contractors' prices. By 2010, the hospital's eligible beneficiary population is projected to grow by 51,354 members as a result of three DoD initiatives: the Base Realignment and Closure (BRAC), the Integrated Global Presence and Basing Strategy (IGPBS) and the Army Modular Force Program (D Villarreal, personal communication, March 20, 2006).

For laundry, the impact of these programs is unknown because of the many reservations with the projected numbers and dates (e.g., timelines, resource requirements and impact of future deployments). What is known is that these programs will definitely increase the laundry workload to some degree. Also, it is unlikely the contractors' prices will increase above the expected value given the actual rates charged to other local hospitals (i.e., Thomason). Therefore, WBAMC should save at least \$1.48M dollars in the next five years with the potential to gain another \$0.74 million (assuming a 50% increase in workload).

*Financial Risks*

At a 4.8% discount rate, the present values of scenario one and two's expected cash outflows are (\$2,595,780) and (\$1,288,001) dollars. Based on these two values alone, scenario one is much riskier than scenario two. When other risks are factored such as cleanliness and quality of finished products, choosing scenario one over two becomes more impractical. This is evident when adjusting scenario one's discount rate from 4.8% to 0% for the higher non-financial risks; scenario one's present value increases from (\$2,595,780) to (\$2,965,870) dollars. This is more than double scenario two's present value.

*Contingencies*

Contingency plans were already factored into scenario two to compensate for any unforeseen problems with the contractor, prices or workload. Three local companies were inspected to ensure that each one could support WBAMC's laundry and transportation needs. If for some unknown reason the new contractor underperforms, another company can be used. Also, this study expects to receive a lower rate than the one figured in year one of the cash flow statement (i.e., 44¢ per pound). This is based on two of the three companies stating that they could provide laundry support at 42¢ per pound. Lastly, a straight line method (i.e., baseline) was used to project future

workloads. However, workload is anticipated to increase in the next five years in response to BRAC, IGBPS and Army Modularity programs.

#### Recommendations and Conclusion

Based on the analysis in the Results and Sensitivity sections, this study recommends withdrawing from UNICOR and contracting with a local company. To ensure a smooth transition and to prevent any potential mismanagement, this study further recommends the following:

1. Establish a Linen Management Committee, in accordance with AR 40-61, to oversee the hospital linen management program.
2. Designate a Contracting Officer Representative (COR) whose responsibilities include but are not limited to monitoring costs and conducting quality assurance inspections.
3. Ensure infection control inspections of the laundry facility are completed by the Infection Control Office.
4. Incorporate the laundry program into the Logistics Division's productivity and performance review meetings.

Even though this study has identified several problems with UNICOR and the Fort Bliss Garrison Command, a majority of those findings could have been prevented if WBAMC complied with AR 40-61, Chapter 7 (Environmental Services). Contrary to the standards outlined in this regulation, the hospital managers

involved with the laundry program mismanaged all tenets of the program for the past few years: costs were not audited, productivity and performance reviews were not conducted, quality assurance inspections were not performed, and a Linen Management Committee was not established. A better process of monitoring the contractor's performance and costs is needed, especially when JCAHO holds hospitals (and not contractors) responsible for ensuring that laundry services are provided safely and effectively. By implementing scenario two, a better process will evolve since many control measures are already in place and ready to execute (e.g., direct billing and payment through the Army's Wide Area Work Flow website and contractor's quality control programs). An established linen management program will also ensure that these control measures and other requirements are maintained. This will allow the hospital governance to focus more on patient care.

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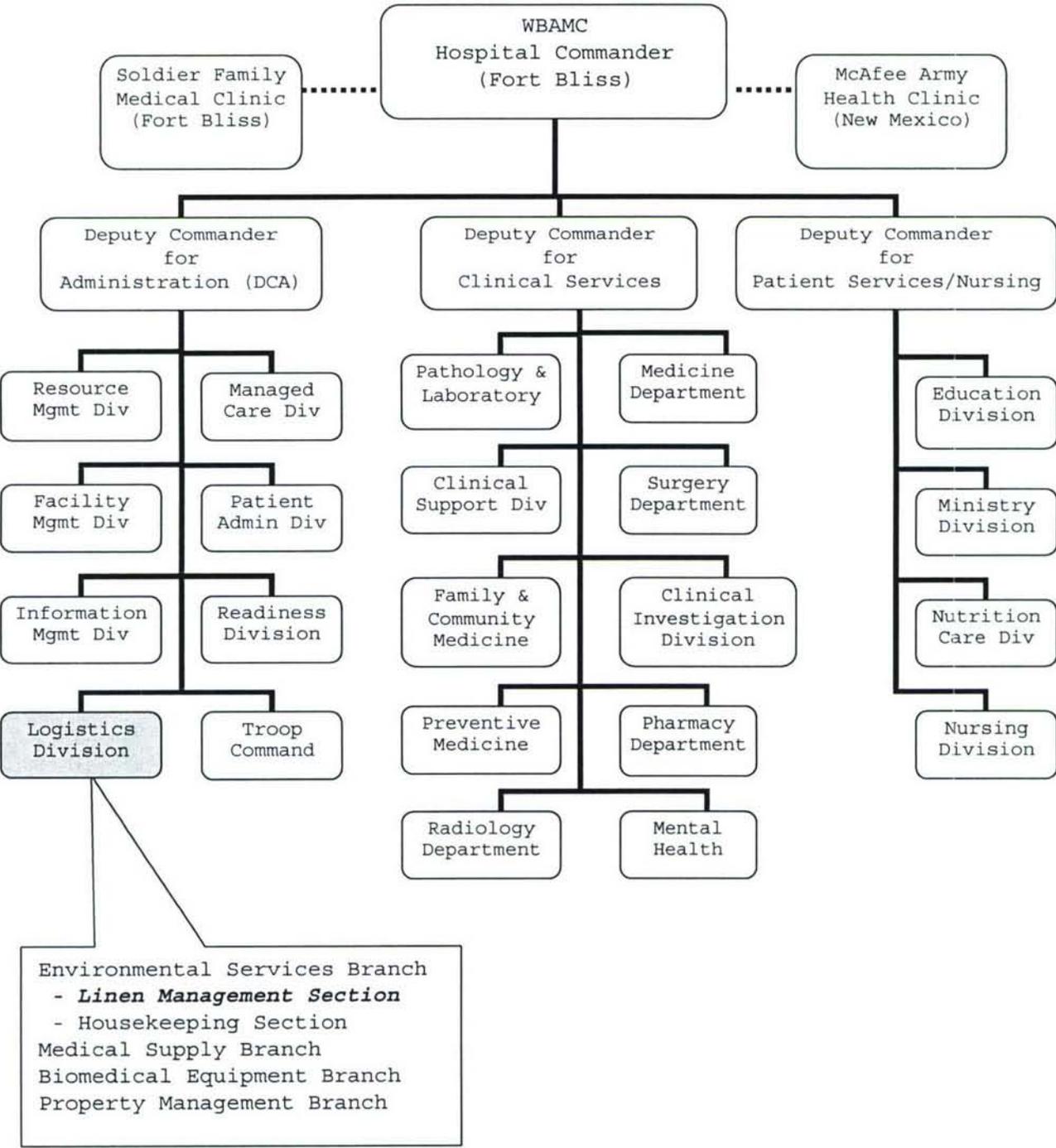
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Appendix A

WBAMC Organizational Structure



## Appendix B

## Organizations supported by Fort Bliss (FY05 - Laundry &amp; Sewing)

	UNIT	Laundry (L)	% of (L)	Sewing (S)	Total (L&S)	% of Total
1	Bowling Center	\$ 488	0%		\$ 488	0%
2	Centennial Club	\$ 15,788	2%		\$ 15,788	1%
3	German Air Force	\$ 1,312	0%		\$ 1,312	0%
4	Japanese A.F.	\$ 2,613	0%		\$ 2,613	0%
5	Japanese Army	\$ 1,829	0%		\$ 1,829	0%
6	JTF-6 (North)	\$ 83	0%		\$ 83	0%
7	Officers Club	\$ 17,376	2%		\$ 17,376	1%
8	VA Hospital	\$ 40,952	5%		\$ 40,952	3%
9	<b>WBAMC Hospital</b>	<b>\$ 568,012</b>	<b>65%</b>		<b>\$ 568,012</b>	<b>45%</b>
10	5035 <sup>TH</sup>	\$ 45,261	5%		\$ 45,261	4%
11	B.O.Q. Billeting	\$ 110,519	13%		\$ 110,519	9%
12	Border Patrol	\$ 637	0%		\$ 637	0%
13	Clint JROTC	\$ 456	0%		\$ 456	0%
14	El Paso JROTC	\$ 2,654	0%		\$ 2,654	0%
15	Deming JROTC	\$ 302	0%		\$ 302	0%
16	FT. Bliss Museum	\$ 101	0%		\$ 101	0%
17	Hot Springs JROTC	\$ 492	0%		\$ 492	0%
18	M.R.C.S.	\$ 15,685	2%		\$ 15,685	1%
19	Socorro JROTC	\$ 399	0%		\$ 399	0%
20	CIF	\$ 35,024	4%	\$ 9,793	\$ 44,817	4%
21	CRC	\$ 17,298	2%	\$ 126,854	\$ 144,152	11%
22	Horizon JROTC	\$ 547	0%	\$ 182	\$ 729	0%
23	Las Cruces JROTC	\$ 312	0%	\$ 390	\$ 702	0%
24	NMSU ROTC	\$ 659	0%	\$ 401	\$ 1,060	0%
25	UTEP ROTC	\$ 618	0%	\$ 152	\$ 770	0%
26	YSLETA JROTC	\$ 2,935	0%	\$ 1,307	\$ 4,242	0%
27	108 <sup>TH</sup> Brigade			\$ 16,887	\$ 16,887	1%
28	11 <sup>TH</sup> Brigade			\$ 24,735	\$ 24,735	2%
29	204 <sup>TH</sup> MI			\$ 1,453	\$ 1,453	0%
30	230 <sup>TH</sup> Finance			\$ 14	\$ 14	0%
31	31 <sup>ST</sup> Brigade			\$ 13,439	\$ 13,439	1%
32	32 <sup>ND</sup> Brigade			\$ 2,065	\$ 2,065	0%
33	35 <sup>TH</sup> Brigade			\$ 233	\$ 233	0%
34	5 <sup>TH</sup> Army			\$ 84,212	\$ 84,212	7%
35	5 <sup>TH</sup> Army/ 76 <sup>TH</sup> MP			\$ 897	\$ 897	0%
36	5 <sup>TH</sup> Army/116 <sup>TH</sup>			\$ 474	\$ 474	0%
37	5 <sup>TH</sup> Army/29 <sup>TH</sup>			\$ 4,205	\$ 4,205	0%
38	6 <sup>TH</sup> Brigade			\$ 1,510	\$ 1,510	0%
39	978 <sup>TH</sup> FORSCOM			\$ 214	\$ 214	0%
40	DPWL			\$ 195	\$ 195	0%
41	USASMA			\$ 223	\$ 223	0%
	Laundry Claims	\$ (1,908)			\$ (1,908)	0%
	Flags			\$ 2,551	\$ 2,551	0%
	Overtime			\$ 84,470	\$ 84,470	7%
	<b>Grand Total</b>	<b>\$ 880,446</b>	<b>100%</b>	<b>\$ 376,855</b>	<b>\$ 1,257,300</b>	<b>100%</b>

Source: Budget Analyst, Resource Management Office, Fort Bliss Garrison Command.

Appendix C

UNICOR Laundry Price Schedule

Hospital Linen	Price per Item	*Overtime Rates	
Baby Blanket	\$0.46	(Option #1 - Without Steam)	
Baby Gown	\$0.35	1 Staff (WS-06)	\$83.56
Baby Sheepskin	\$0.46	13 Inmates	\$71.18
Baby Sleeper	\$0.35	Operating Cost	\$27.38
Baby Stockings	\$0.35	<u>Hourly Total</u>	<u>\$182.12</u>
Baby Undershirt	\$0.25	4 Hrs Minimum	\$728.48
Bag Laundry	\$0.58		
Bathrobes	\$0.58		
Bedspread	\$0.58		
Blanket Cotton	\$0.58	(Option #2 - With Steam)	
Cloth Wash	\$0.35	1 Staff (WS-06)	\$83.56
Coat Pajama	\$0.46	13 Inmates	\$71.18
Coat Surgical	\$0.46	Boiler Operator	\$85.97
Cover Mattress	\$0.58	Operating Cost	\$54.75
Drapes	\$1.39	<u>Hourly Total</u>	<u>\$295.46</u>
Gown Surgical	\$0.58	4 Hrs Minimum	\$1,181.84
Misc Large	\$0.70		
Misc Medium	\$0.35		
Misc Small	\$0.35		
Pad Bed/Matt	\$0.58		
Pant Operating	\$0.46		
Pillowcase	\$0.35		
Salvage (dyed)	\$0.15		
Sheet Bed	\$0.46		
Sheet Fitted	\$0.46		
Smock Doctor	\$0.93		
Socks Pair	\$0.35		
Towel Bath	\$0.46		
Towel Hand	\$0.35		
Trouser Pajama	\$0.46		
Wrapper 36"	\$0.46		
Wrapper 54"	\$0.46		
Wrapper Small	\$0.46		

\* Saturday/Holiday services

## Appendix D

Fort Bliss Garrison Command  
(Projected Laundry Savings for FY05-FY10)

FACILITY	FY05	FY06	FY07
<b>A. UNICOR</b>			
Total Pieces*	1,553,556	1,553,556	1,553,556
Total Annual Cost	(\$768,401)	(\$791,453)	(\$815,197)
Ave Cost Per Piece	\$0.49	\$0.51	\$0.52
<b>B. SUPREME LAUNDRY</b>			
Total Pieces	1,553,556	1,553,556	1,553,556
Total Annual Cost**	(\$1,024,780)	(\$1,055,524)	(\$1,087,189)
Ave Cost Per Piece	\$0.66	\$0.68	\$0.70
<b>C. DIFFERENCE (A-B)</b>	<b>\$256,379</b>	<b>\$264,071</b>	<b>\$271,993</b>

\* Based on total pieces in FY 2004 (Base Year)

\*\* Prices were increased at a rate of 3% per year. Also, prices include a 15% transportation costs on top of the laundry costs. The 15%=\$174,775 in FY04.

FACILITY	FY08	FY09	FY10
<b>A. UNICOR</b>			
Total Pieces*	1,553,556	1,553,556	1,553,556
Total Annual Cost	(\$839,653)	(\$864,842)	(\$890,788)
Ave Cost Per Piece	\$0.54	\$0.56	\$0.57
<b>B. SUPREME LAUNDRY</b>			
Total Pieces	1,553,556	1,553,556	1,553,556
Total Annual Cost**	(\$1,119,805)	(\$1,153,399)	(\$1,188,011)
Ave Cost Per Piece	\$0.72	\$0.74	\$0.76
<b>C. DIFFERENCE (A-B)</b>	<b>\$280,152</b>	<b>\$288,557</b>	<b>\$297,214</b>

**D. CUMULATIVE SAVINGS FY2006-2010: \$1,398,987**

Source: UNICOR Contracting Officer Representative, Directorate of Logistics, Fort Bliss Garrison Command.

## Appendix E

## Sodexo Laundry Inspection Checklist

<b>Soiled Linen Area</b>	<u>Go</u>	<u>No Go</u>
1. Soiled linen baskets marked accordingly, used for soiled linen only and routinely cleaned.		
2. Soiled linen sorted for maximum effectiveness of cleaning.		
3. Employee wearing necessary protective covering when working with soiled linens.		
<b>Washroom Area</b>		
1. Surgery linen washed separately from general linen.		
2. Procedures and formula for stained linen established and in use.		
3. Washers clean and free of soap buildup.		
<b>Dry Fold / Dryer Area</b>		
1. Stained or torn linen sorted out by folders		
2. Cleaned linen baskets marked accordingly, used for clean linen only, and routinely cleaned.		
3. Folding tables clean.		
<b>General</b>		
1. Distribution carts, covers cleaned.		
2. Overall appearance of laundry floor, walls, windows clean.		
3. Lights and high ledges free of dust and dirt.		
4. Fans, vents clean and properly screened for safety.		
<b>Delivery Carts</b>		
Free of cracks, jagged edges, wheels clean, free of trash, string, debris, etc.		
<b>Delivery Trucks</b>		
Visibly clean, free of debris.		
<b>Pest Control</b>		
Documentation of spraying treatments.		
<b>Employee Training</b>		
Documentation of employee training for their specific areas of responsibility.		

## Appendix F

## Laundry Contracts for the U.S. Army Medical Command (MEDCOM)

<u>Installation / Military Hospital</u>	<u>Contractor</u>
1. Ft Belvoir / DeWitt ACH	BASOPS
2. Ft Benning / Martin ACH	Angelica Textile Services Inc
3. Ft Bliss / Beaumont AMC	UNICOR (via BASOPS)
4. Ft Bragg / Womack AMC	Halifax Linen Service
5. Ft Campbell / Blanchfield ACH	BASOPS
6. Ft Carson / Evans ACH	Goodwill Industries Service
7. Ft Drum / Guthrie AHC	Syracuse Linen Supply
8. Ft Eustis / McDonald ACH	VA Hunter Homes McGuire MEDCEN
9. Ft Gordon / Eisenhower AMC	Crothall Service Group Inc
10. Ft Hood / Darnall ACH	VA Central Texas Health Care
11. Ft Huachuca / Bliss AHC	AmeriPride
12. Ft Irwin / Weed ACH	VA Greater Los Angeles HC Sys
13. Ft Jackson / Moncrief ACH	BASOPS
14. Ft Knox / Ireland ACH	Elizabethtown Laundry Co
15. Ft Leavenworth / Munson AHC	BASOPS
16. Ft Lee / Kenner AHC	VA Hunter Homes McGuire MEDCEN
17. Ft Leonard Wood / GLWACH	BASOPS
18. Ft Lewis / Madigan AMC	Northwest Center Industries
19. Ft Meade / Kimbrough ACC	Up-To-Date
20. Ft Monmouth / Patterson AHC	BASOPS
21. Ft Polk / Bayne-Jones ACH	VA Alexandria LA
22. Ft Riley / Irwin ACH	Penn Enterprises
23. Ft Rucker / Lyster ACH	BASOPS
24. Ft Sam Houston / Brooke AMC	VA South Texas Healthcare Sys
25. Ft Sill / Reynolds ACH	VA Center, Oklahoma City
26. Ft Stewart / Winn ACH	Resort Services Inc
27. Ft Wainwright / Bassett ACH	BASOPS
28. Germany / Heidelberg ACH	Haber Textile Dienste
29. Honolulu / Tripler AMC	BASOPS
30. Germany / Landstuhl RMC	Haber Textile Dienste
31. Redstone Arsenal / Fox AHC	Aramark
32. Washington / Walter Reed AMC	Up-To-Date Laundry
33. West Point / Keller ACH	BASOPS
34. Germany / Wuerzburg ACH	Leimeister

Source: Program Management Office for Environmental Services, ACSLOG, U.S. Army Medical Command, Fort Sam Houston

## Appendix G

## Scenario One

## (Cost-Per-Pound Calculation)

COSTS	Year 0 Base	Year 1 FY07	Year 2 FY08	Year 3 FY09	Year 4 FY10	Year 5 FY11
I. UNICOR						
Laundry	\$430,059	\$473,064	\$473,064	\$473,064	\$473,064	\$473,064
Overtime Fees for Saturday Laundry	\$54,859	\$54,859	\$54,859	\$54,859	\$54,859	\$54,859
II. WBAMC						
Transportation (Vehicle)	\$10,893	\$11,445	\$12,037	\$12,671	\$13,345	\$14,060
Transportation (Labor)	\$45,929	\$47,307	\$48,727	\$50,188	\$51,694	\$53,245
Overpayments to Ft Bliss	\$70,126	\$0	\$0	\$0	\$0	\$0
III. Total Costs	\$611,866	\$586,675	\$588,687	\$590,782	\$592,962	\$595,228
Workload in Clean Pounds	635,213	635,213	635,213	635,213	635,213	635,213
<b>Cost Per Clean Pound</b>	<b>\$0.96</b>	<b>\$0.92</b>	<b>\$0.93</b>	<b>\$0.93</b>	<b>\$0.93</b>	<b>\$0.94</b>

## Appendix H

## Cash Flow Statement

COSTS & WORKLOAD	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
	Base	FY07	FY08	FY09	FY10	FY11
<b>I. SCENARIO ONE (UNICOR)</b>						
Price and Workload						
Cost per pound (clean)	\$0.96	\$0.92	\$0.93	\$0.93	\$0.93	\$0.94
Workload in pounds	635,213	635,213	635,213	635,213	635,213	635,213
SUBTOTAL <sup>a</sup>	(\$609,804)	(\$584,396)	(\$590,748)	(\$590,748)	(\$590,748)	(\$597,100)
Physician Smocks	\$0.93	\$1.02	\$1.02	\$1.02	\$1.02	\$1.02
Workload in pieces	2,378	2,378	2,378	2,378	2,378	2,378
SUBTOTAL	(\$2,212)	(\$2,426)	(\$2,426)	(\$2,426)	(\$2,426)	(\$2,426)
TOTAL	(\$612,016)	(\$586,822)	(\$593,174)	(\$593,174)	(\$593,174)	(\$599,526)
<b>II. SCENARIO TWO (CONTRACTOR)</b>						
Price and Workload						
Cost per pound (clean)	\$0.44	\$0.44	\$0.45	\$0.46	\$0.47	\$0.48
Workload in pounds	635,213	635,213	635,213	635,213	635,213	635,213
SUBTOTAL	(\$279,494)	(\$279,494)	(\$285,846)	(\$292,198)	(\$298,550)	(\$304,902)
Physician Smocks	\$1.69	\$1.69	\$1.74	\$1.79	\$1.84	\$1.90
Workload in pieces	2,378	2,378	2,378	2,378	2,378	2,378
SUBTOTAL	(\$4,019)	(\$4,019)	(\$4,138)	(\$4,257)	(\$4,376)	(\$4,518)
TOTAL	(\$283,513)	(\$283,513)	(\$289,984)	(\$296,455)	(\$302,926)	(\$309,420)
<b>III. NET SAVINGS SUMMARY</b>						
Net Savings <sup>b</sup>		\$303,309	\$303,190	\$296,719	\$290,248	\$290,106
Cumulative Net Saving		\$303,309	\$606,499	\$903,218	\$1,193,466	\$1,483,572
NPV discounted at 4.8%		\$1,293,356				

<sup>a</sup>Subtotal differs from total costs in Appendix G due to rounding.

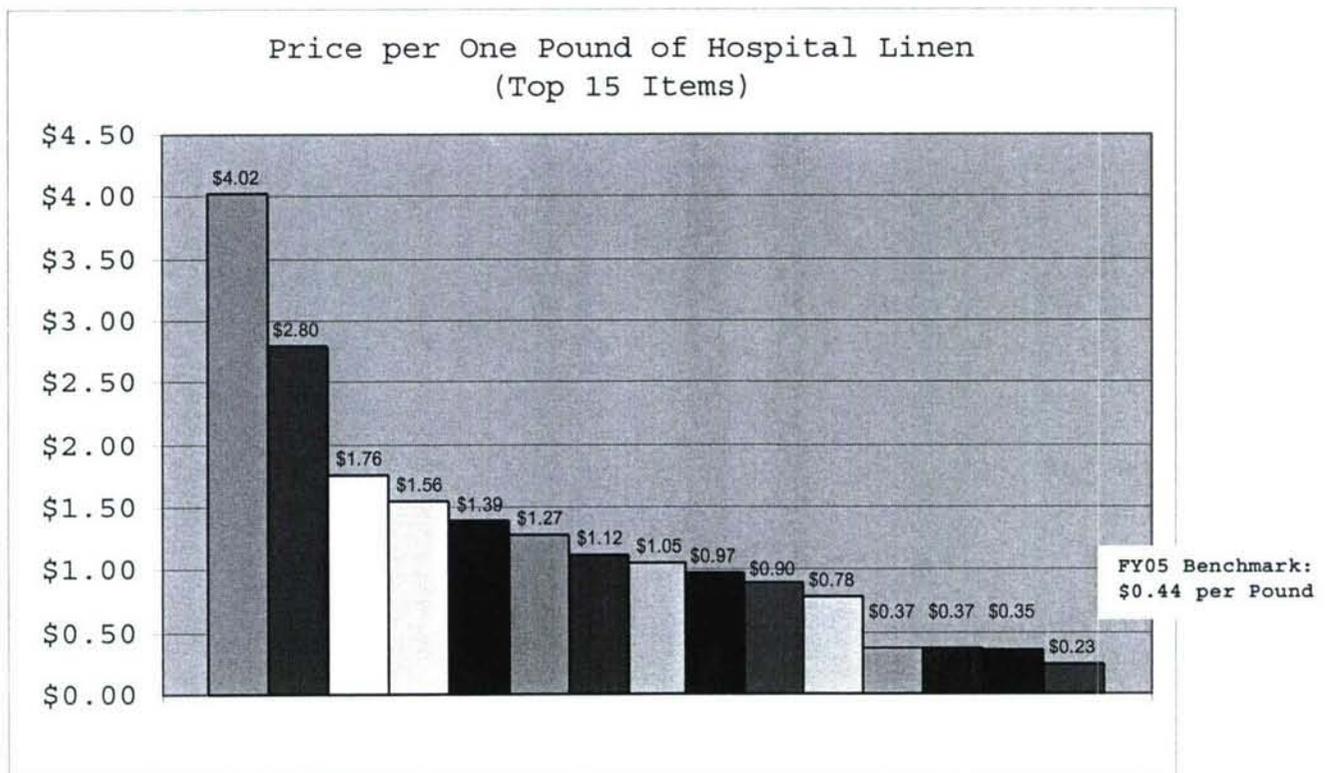
<sup>b</sup>Net Savings = Scenario Two Cash Outflow Total – Scenario One Cash Outflow Total

Appendix I

(UNICOR Price Schedule Analysis)

LINEN	UNICOR Price (Piece)	FY05 Pieces (WBAMC)	Total Pieces (%)	Pounds of Each*	Pieces to = 1.0 lb	Price Per One Pound
	A			B	C = 1/B	D=CxA
1. Cloth Wash	\$0.35	10277	1.1%	0.087	11.5	\$4.02
2. Towel Hand	\$0.35	135480	14.5%	0.125	8.0	\$2.80
3. Baby Blanket	\$0.46	23023	2.5%	0.262	3.8	\$1.76
4. Pillowcase	\$0.35	73734	7.9%	0.225	4.4	\$1.56
5. Coat Surgical	\$0.46	59996	6.4%	0.331	3.0	\$1.39
6. Coat Pajama	\$0.46	5385	0.6%	0.363	2.8	\$1.27
7. Trouser Pajama	\$0.46	11705	1.3%	0.413	2.4	\$1.11
8. Bathrobes	\$0.58	10719	1.2%	0.550	1.8	\$1.05
9. Gown Surgical	\$0.58	89356	9.6%	0.600	1.7	\$0.97
10. Pant O.R.	\$0.46	58417	6.3%	0.512	2.0	\$0.90
11. Towel Bath	\$0.46	95998	10.3%	0.587	1.7	\$0.78
12. Bag Laundry	\$0.58	38561	4.1%	1.550	0.6	\$0.37
13. Sheet Bed	\$0.46	240683	25.8%	1.250	0.8	\$0.37
14. Sheet Fitted	\$0.46	25794	2.8%	1.300	0.8	\$0.35
15. Blanket	\$0.58	49893	5.4%	2.475	0.4	\$0.23
Total (15 items above)		929021	99.6%			
Grand Total (32 items)		933016	100.0%			

\* The linens were randomly weighed on a calibrated scale.



## Appendix J

## (Waiver Analysis)

## I. FORT BLISS GARRISON COMMAND (FY04-ORIGINAL)

	SUPREME (a)	UNICOR (b)	DIFFERENCE (b-a)
a. Workload			
Pieces	1,553,566	1,553,566	NA
b. Costs			
Laundry	(\$820,157)	(\$746,021)	\$74,136
Transportation	(\$174,775)	(\$0)	\$174,775
c. Total	(\$994,932)	(\$746,021)	\$248,911

## II. BUSINESS CASE ANALYSIS (FY04-REVISED)

	SUPREME (a)	UNICOR (b)	DIFFERENCE (b-a)
a. Workload			
Pieces	182,690 <sup>a</sup>	1,553,566	1,370,876 <sup>a</sup>
Pounds	853,426 <sup>a</sup>	NA	NA
b. Costs			
Laundry (Pieces)	(\$188,922)	(\$746,021)	(\$557,099)
Laundry (Pounds)	(\$418,179) <sup>b</sup>	NA	\$418,179
c. Total	(\$607,101)	(\$746,021)	(\$138,920)

## III. PROJECTED COST (BASED ON FY04 REVISED COSTS)

	FY06	FY07	FY08	FY09	FY10
Supreme	(\$644,072) <sup>c</sup>	(\$663,395)	(\$683,296)	(\$703,795)	(\$724,909)
UNICOR	(\$791,453) <sup>c</sup>	(\$815,197)	(\$839,653)	(\$864,842)	(\$890,788)
Difference	(\$147,381)	(\$151,802)	(\$156,356)	(\$161,047)	(\$165,878)
Cumulative Costs	(\$147,381)	(\$299,183)	(\$455,539)	(\$616,586)	(\$782,465)

<sup>a</sup>Given Supreme's total workload of 1,553,566 pieces, this study subtracted the hospital's top 15 textiles (also in pieces) from that total. The top 15 items accounted for 88% (1,370,876) of the 1,553,566 pieces. Then using Appendix I linen weights, the 1,370,876 pieces were recalculated to pounds (853,426).

<sup>b</sup>Based on Supreme's cost per pound rate of \$0.49: 853,426 x \$0.49 = \$418,179

<sup>c</sup>3% rate increase per year starting with FY05.

## Appendix K

## Sensitivity analysis for changes in workload and price values

Percent Change from Base Case	<u>Net Present Value<sup>a</sup></u>		<u>Cumulative Net Savings</u>	
	Workload	Contractor's Rates	Workload	Contractor's Rates
-30%	\$905,347	\$1,658,355	\$1,038,498	\$1,902,785
-20%	\$1,034,685	\$1,545,978	\$1,186,858	\$1,773,722
-10%	\$1,164,021	\$1,405,751	\$1,335,216	\$1,612,659
Base Case (0%)	\$1,293,356	\$1,293,356	\$1,483,572	\$1,483,572
10%	\$1,422,690	\$1,165,485	\$1,631,927	\$1,335,237
20%	\$1,552,026	\$988,034	\$1,780,285	\$1,129,924
30%	\$1,681,364	\$875,479	\$1,928,645	\$1,000,646
40%	\$1,810,698	\$735,391	\$2,077,000	\$839,750
50%	\$1,940,034	\$622,874	\$2,225,358	\$710,520

Note. Sensitivity analysis on workload was done for both scenarios. Sensitivity analysis on prices (i.e., cost-per-pound) was done for scenario two only and not UNICOR or both.

<sup>a</sup>Discounted at a 4.8% rate.

## Footnotes

1. The Fort Bliss Garrison Command is responsible for overseeing all services and support provided on the installation: family housing, dining facilities, construction, utilities, logistics support, environmental services and others.

2. Even though it is not specified in the agreement, UNICOR does provide laundry services on Saturdays for additional fees (see Appendix C).

3. The Chief of Logistics Division sent UNICOR and the Fort Bliss Resource Management representatives a draft memorandum stating the hospital's intent to withdraw from the laundry agreement. This was done without the approval of the hospital governance.

4. Per the memorandum of agreement, WBAMC is responsible for the delivery of the hospital linens to and from the laundry facility (i.e., transportation support). This arrangement is contrary to industry and local standards in which the contractor (not the customer) is responsible for providing this service. UNICOR stated that they were unable to meet the hospital's daily transportation needs due to a shortage of qualified drivers and other internal issues (i.e., inmates) (A. Borrego, personal communications, January 25, 2006).

5. When laundry operations are conducted within the hospital, it is considered to be *in-house*. When multiple healthcare organizations share resources and costs to operate a laundry facility, that facility is normally *centrally* located. *Commercial laundry* refers to a private company that offers its services for a certain price.

6. "Bloodborne pathogens means pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV)" (OSHA, n.d., 1910.1030b section).

7. State rules and regulations might not reflect the fact that lower temperatures are also effective in destroying microscopic organisms when wash formulas are properly controlled. Some states may still require healthcare laundry facilities to process linen at higher temperatures. According to Otero (n.d.a), former director of academic affairs for the National Association of Institutional Linen Management (NAILM), laundry managers must educate the medical staff on the modern processes. This is particularly true when state rules and regulations do not reflect the latest standards or methods of laundering.

8. According to D.S. Erickson (chairman for the AIA Interpretation Committee), the AIA standards cited by CDC are

intended for new construction or renovation projects. The AIA standards do not apply to existing structures or systems if that standard did not exist at the time (personal communication, December, 15, 2005).

9. Base Operations (BASOPS) is broadly defined as services and support provided on military installations. See footnote 1.

10. The Federal Acquisition Regulation (FAR) restricts WBAMC from providing prospective contractors with the hospital's actual workload data. In turn, these contractors can only estimate what they would charge WBAMC based on such factors as the hospital's size (e.g., number of beds). Only during the solicitation process of contracting (when actual workload is available) can contractors provide concrete rates (K. Parkin, personal communication, January 17, 2006)

11. The daily abstract report, which itemizes linen costs, was used to exclude linen that was not within the scope of this study (i.e., dining facility). Also, UNICOR tracked workload in soiled weights. A 10% conversion factor (per the memorandum of agreement) was used to convert the soiled weights to clean poundage.

12. The motor-vehicle-operator's salary and benefits in FY 2005 were not used because of the operator's retirement in June of 2005.

13. Three local companies provided price quotes on their laundry and transportation services. The average of the three quotes (44¢ per clean pound) was used as the base year in the cash flow statement.

14. For the purposes of this study, the dining facility's textiles were excluded. However, if scenario two is approved, these textiles will be included in the new contract.

15. It was discovered during this study that the Fort Bliss Resource Management Office erroneously billed the hospital for another organization's laundry: \$68,779 in FY03, \$139,338 in FY04 and \$70,126 in FY05. The hospital paid these bills. It is not known how long WBAMC has been overpaying Fort Bliss since the Resource Management Office does not maintain data prior to FY03. These overpayments were included in Year 0 of the cash flow statement under the business as usual (status quo) scenario.

16. Even though it is not stipulated in the 1993 memorandum of agreement, UNICOR has been weighing the hospital's soiled linen per the Linen Management Section's request. However, the 10% clean to soil conversion factor is stipulated in the agreement. It is also within industry standards: 7%-10% (Kehoe et al., 2004).

17. UNICOR proposed a 10% price increase in November 2005 with the justification that its overhead costs rose an average

of 3% for the past five years while their fees have not changed since 2000 (L.V. Harris, personal communication, November 22, 2005). Fort Bliss Garrison Command representatives stated it was too late in FY 2006 to accommodate for the price increase but they would seriously consider it for the next fiscal year (I. Reed, personal communication, December 7, 2005). This study assumed under the status quo scenario that Fort Bliss would approve the price increase in Year 1 with no further increases in Years 2 to 5.

18. UNICOR did not request a price increase for its overtime rates. See Results and Business Impacts section.

19. Lease and mileage fees increased at a rate of 2% and 7% in FY 2003 to FY 2005 (V. Flores, personal communication, February 23, 2006). Due to the unpredictability of gas prices, it was assumed that this trend would continue.

20. The straight line method was used for the laundry workload. However, productivity is expected to increase within the next five years due to BRAC, IGPBS and Army Modularity programs. The impact of these programs on laundry is not known at this time. A sensitivity analysis will be done to look at workload changes and its affect on the cumulative net savings.

21. Physician smocks are considered specialty items (not bulk). Both UNICOR and contractors charge smocks by pieces.

22. Local companies estimated that their rates would increase about 3% a year.