

BUSINESS CASE ANALYSIS



Department of Homeland Security
**Environmental Sustainability
Information System**

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Contents

Executive Summary	1
Section 1. ESIS Business Case Analysis Introduction	3
1.1 ESIS Background.....	4
1.2 ESIS BCA Scope	4
1.3 BCA Methodology	4
Section 2. Why Invest in an ESIS? (ESIS Benefits)	5
Section 3. Current State Assessment and Future ESIS Vision	16
3.1 Current State Assessment.....	16
3.2 DHS Future ESIS Requirements and Vision	18
3.3 Proposed ESIS Software Modules.....	19
3.3 ESIS Implementation Best Practices	28
3.3 DHS Top Management Support Requirements.....	28
3.4 DHS ESIS Implementation Technical Requirements.....	29
Section 4. Gap Analysis (Comparison of Current to Future State)	31
Section 5. ESIS Implementation Alternatives Analysis	32
5.1 ESIS List of Alternatives.....	32
5.2 ESIS Alternatives Evaluation and Weighting Criteria.....	33
5.3 Analytical Scoring Approach.....	34
5.4 Scoring Methodology	35
Section 6. BCA Decision Analysis.....	36
6.1 Alternative 1: Status Quo (Baseline).....	36
6.2 Alternative 2: ESIS Not Centrally Funded and Externally Hosted ...	37
6.3 Alternative 3: ESIS Centrally Funded and Externally Hosted.....	37
6.4 Alternative 4: ESIS Centrally Funded and Internally Hosted.....	38
6.5 Analysis of Alternatives: Conclusion	38
Section 7. ESIS Benefit-Cost Analysis	39
7.1 ESIS Benefit-Cost Analysis Approach	39
7.2 Status Quo Pricing for the Current State.....	40
7.3 Life Cycle Pricing for the Selected Alternative Number 4	41
Section 8. ESIS Implementation Challenges and Risks	42
8.1 Cultural Challenges and Risks.....	42
8.2 Financial Challenges and Risks.....	43
8.3 Technological Challenges and Risks	43
Section 9. Conceptual ESIS Operations.....	44
9.1 Concept of Operations (CONOPS).....	44

9.2	Impacts Associated with DHS Information Technology Standards .	44
9.3	ESIS Security Considerations.....	45
	Section 10. ESIS Implementation Next Steps	46
	Appendix 1 – Glossary	47
	Appendix 2 – Environmental Systems Reviewed	49
	Appendix 3 – Estimated Annualized Life Cycle Costs	50
	Appendix 4 – ESIS Requirements by Capability	51
	Appendix 5 – Compliance Assurance Matrix.....	52

Executive Summary

This Business Case Analysis (BCA) has been prepared to support the Department of Homeland Security's (DHS) goal of implementing an Environmental Sustainability Information System (ESIS) that will enhance environmental sustainability and improve environmental compliance.

The users of the planned ESIS will be the following DHS component (COMPONENT) organizations:

- United States Citizenship and Immigration Services (USCIS)
- United States Coast Guard (USCG)
- Customs and Border Protection (CBP)
- Federal Emergency Management Agency (FEMA)
- Federal Law Enforcement Training Center (FLETC)
- Immigration and Customs Enforcement (ICE)
- Secret Service (US-SS)
- Science and Technology (S&T)
- Transportation Security Administration (TSA)
- US Visitor and Immigrant Status Indicator Technology (US-VISIT)

DHS COMPONENTS currently use a variety of software tools and manual (paper-based) methods to manage environmental sustainability and compliance. While these tools support various compliance functions, there is no system in use DHS-wide or within the COMPONENTS that provides a comprehensive, integrated system to manage environmental sustainability and compliance.

The purpose of this BCA is to justify investing in a DHS-wide ESIS and select the best option for its implementation from the four alternatives listed below.

1. Maintain the status quo.
2. DHS implements an ESIS that is not centrally funded and is externally hosted.
3. DHS implements an ESIS that is centrally funded and is externally hosted.
4. DHS implements an ESIS that is centrally funded and is internally hosted within the DHS network.

This BCA recommends Alternative Number 4, which is the implementation of an ESIS that is centrally funded by DHS and hosted within the DHS internal computer network.

DOCUMENT REVISION HISTORY

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Initial	2/22/2010	Draft Business Case Analysis (submitted for comments)
1	6/21/2010	Final Business Case Analysis

Section 1. ESIS Business Case Analysis Introduction

Preparing a Business Case Analysis (BCA) is a critical initial step in the lifecycle of a proposed software implementation process. A BCA provides the decision-making framework upon which a proposed Information Technology (IT) investment is justified. A BCA also explains in some detail how the proposed system would be implemented.

The purpose of this BCA is to justify the investment in an enterprise-wide Environmental Sustainability Information System (ESIS), and also to recommend the best option for its implementation from the four alternatives listed below.

1. Maintain the status quo.
2. Implement an ESIS that is funded by the DHS COMPONENTS (not centrally funded) and externally hosted.
3. Implement an ESIS that is centrally funded and externally hosted.
4. Implement an ESIS that is centrally funded by DHS and internally hosted within the DHS internal network.

This BCA recommends Alternative Number 4, which is the implementation of an ESIS that is centrally funded and hosted within the DHS internal network (Intranet).

In preparing this BCA, DHS-HQ and COMPONENT environmental managers together with key subject matter experts (SMEs) were interviewed. The organizations interviewed are listed in Table 1 below.

Table 1 – Organization’s Interviewed

Organization	
DHS	Department of Homeland Security
USCIS	United States Citizenship and Immigration Services
USCG	United States Coast Guard
CBP	Customs and Border Protection
FEMA	Federal Emergency Management Agency
FLETC	Federal Law Enforcement Training Center
ICE	Immigration and Customs Enforcement
S&T	Science and Technology
TSA	Transportation Security Administration
USSS	Secret Service
US VISIT	United States Visitor and Immigrant Status Indicator Technology

Inputs from these interviews are incorporated into the BCA analysis and recommendations.

1.1 ESIS Background

DHS COMPONENTS currently use a variety of software tools to manage environmental sustainability and compliance. Software tools used include common desktop applications such as Microsoft Word, Excel spreadsheets, Access databases, and SharePoint portals.

COMPONENTS also use manual (paper-based) systems to manage their environmental work-products.

DHS Headquarters (DHS-HQ) and the COMPONENTS also use a number of web-based applications to assist with environmental compliance. Most of these applications are focused on specific areas (e.g., CP-Track for environmental compliance auditing and the National Environmental Policy Act (NEPA) application used by DHS-HQ to manage NEPA process activities).

There is no integrated system within the COMPONENTS or across DHS that provides a comprehensive enterprise system for environmental management. One notable exception is the USCG's use of EnviroManager software to manage a number of environmental compliance requirements which include: Environmental Management Systems (EMS), Compliance Training, Tanks and Environmental Compliance Evaluation (ECE) Audits.

Most of the COMPONENTS maintain headquarters type operations based in Washington, D.C. that provide environmental compliance management oversight. Most of the COMPONENTS also maintain extensive field operations across the country (e.g., USCG stations located at coastal areas around the country; TSA field operations located at airports; and CBP posts located along the Mexican and Canadian borders). It is expected that the proposed ESIS will meet the environmental management requirements of the headquarters operations users and also that of the field operations users.

1.2 ESIS BCA Scope

DHS desires to put in place a software solution that supports environmental sustainability, compliance management, compliance assurance, International Organization for Standardizations (ISO) 14001 EMS implementation and risk management.

The proposed solution may also include capabilities for financial management, budget tracking and self-service report generation.

Since DHS COMPONENTS vary in size and complexity of operation, the proposed ESIS must meet the needs of large and small COMPONENTS.

The implementation of the ESIS would also incorporate work-products from COMPONENTS with environmental programs that have been in place for some time and have extensive legacy data and documents residing in current and older systems.

1.3 BCA Methodology

The Microsoft Rapid Economic Justification (REJ) process was used as a framework to write this BCA. The REJ facilitates a structured process to select a proposed software solution from an evaluation of

alternatives. In supporting this decision-making process, the REJ methodology incorporates the use of Balanced Scorecard and Six Sigma principles.

In developing this BCA, information was collected from DHS-HQ and COMPONENT interviews. Checklists were used to document how the Department's environmental compliance functions that would benefit from software are managed. The areas where looked at where: sustainability, tanks, hazardous materials, hazardous waste, asbestos, air, water, audits, environmental management systems, and green house gas emissions tracking.

Information was also collected about how different software tools are used by the COMPONENTS to assist with day-to-day environmental compliance management, compliance assurance, and sustainability.

Results from the COMPONENT interviews were put into a matrix presenting the potential level of need for software. The results were then numerically tabulated and summarized with the need for each software function capability ranked from highest to lowest priority.

Instead of using a complicated Needs Assessment protocol, this BCA utilized qualitative grading levels to prioritize needs from "Mid-to-High-Need" to "No-to-Low Need". The rationale behind the broad options used was the recognition that needs change. For example, some software capability needs do not currently exist but may be required in the near future. Furthermore, a COMPONENT may currently have a high need for a specific capability (e.g., to manage NEPA actions at a large property that is set to be privatized) that will be lessened significantly in the future (following the sale of the property).

In addition to the Needs Assessment, in reviewing the four ESIS implementation alternatives presented in the latter sections of the BCA, the selection process took into account factors such as:

- Overall cost
- Risk
- Software capability

A detailed reporting of this analysis is included in Sections 5, 6, and 7 of this document.

Section 2. Why Invest in an ESIS? (ESIS Benefits)

It is expected that this BCA's recommended option for a centrally funded ESIS that is hosted by DHS would provide the following significant benefits:

1. Improve compliance with environmental regulations through the use of compliance-focused software modules.

A total of sixteen (16) environmental compliance and sustainability software modules (listed below) would be made available to DHS-HQ and the COMPONENTS to assist with day-to-day compliance management and assurance.

Proposed ESIS Modules

Environmental Sustainability Portal	Compliance Guide Management and Regulations Access	Hazardous Waste Management	Green House Gas Emissions Management
ISO 14001 Environmental Management System (EMS)	Cultural, Archaeological and Historical Inventory Management	Environmental Compliance Training Management	Geographic Information System (GIS) Viewer Portal
Environmental Compliance Evaluation Audit Management	Asbestos Inventory Management	Air Compliance Management	PCB and ODC Inventory Management Portal
Compliance Requirements Annual Planner	Hazardous Materials Management and Chemical Compliance Assurance	Water Compliance Management	<i>Additional Custom Application Modules (as needed)</i>

Each of the compliance-focused modules would facilitate the documentation of compliance and provide on-going evidence of compliance with Federal, State and Local regulations. The Chemical Assurance Matrix within the Hazardous Materials Module, for example, would contain information about regulated hazardous chemicals used at a facility and identify which ones exceed regulatory thresholds. This feature would be important in helping organizations avoid costly non-compliance fines and provide environmental managers with the assurance that any hazardous chemicals that exceed regulatory thresholds are being appropriately reported and managed.

The ESIS would also provide the ability for COMPONENTS to generate a number of compliance reports (e.g., Form R, Tier II, TRI, DMRs) and completed forms (e.g., DD1348 waste manifest forms with information obtained from the Hazardous Waste Module).

Another example of a compliance module feature that would promote DHS-wide compliance assurance would be a DHS-HQ user querying the Compliance Audit Module to list high-risk compliance findings that could result in Notices of Violation, and reviewing their timely resolution and closure status.

A single ESIS would also allow for the simplified rollup of compliance and sustainability data from multiple COMPONENTS to give DHS-HQ an overarching view of environmental risk across the Department.

2. Improves the tracking and management of established sustainability goals.

Sustainability goals are best tracked and reported when the metrics are transparent and are regularly updated. The proposed ESIS Sustainability Module would provide DHS-HQ users with the ability to track and report DHS-wide environmental performance goals.

Summary snapshots of this information would also be made available to COMPONENTS, so that they could view their ongoing performance and also strive for continuous improvement by establishing their own specific sustainability goals that would augment DHS's corporate goals.

The web-based capabilities presented by the ESIS would also reduce the time spent requesting and collecting key environmental information from COMPONENTS that would be used to generate the DHS metrics reports. In many instances, the data required for the DHS metrics could be automatically pulled from data routinely updated by the COMPONENTS.

3. Minimizes COMPONENT environmental risks.

The ESIS asset inventory tools like the asbestos, tanks, cultural resources, EMS aspects, hazardous materials and hazardous waste modules would give COMPONENT organizations and DHS-HQ a detailed listing of potential liabilities and environmental risks. In using the ESIS, COMPONENTS would have accurate, up-to-date access to information about their regulated: tanks, asbestos locations, the existence of PCBs in equipment and cultural resources assets.

Once regulated environmental asset information is populated in the ESIS for all the COMPONENTS, powerful queries can be run against the ESIS database by DHS-HQ and the COMPONENTS. Examples of queries might include: Where are all the Underground Storage Tanks (USTs) that contain bulk fuels above 1,000 pounds? Another query could be: What COMPONENT facilities and processes use specific regulated chemicals like sulfuric acid or acetone and in what quantities during this fiscal year?

4. Provides a standardized interface for structured environmental data collection that leads to consistent outputs.

With the ESIS providing a standardized interface for adding environmental data, consistent outputs with complete information would be available to all users. For example, when adding tank information into the ESIS, COMPONENTS would need to add a specific set of required information before the record is committed to the database. When data is added in this way, the resulting reports provide consistent outputs that have all the required content populated.

Once information is added this way, DHS-HQ and the COMPONENTS would also be able to query the ESIS and expect to receive a specific set of quality data in return that could be used for decision support purposes (e.g. data calls).

5. Improves compliance with environmental regulations by providing a library of historical and continuously updated Federal, State, and Local environmental regulations.

Within the software, a feature would be included to provide COMPONENT and DHS-HQ environmental managers with access to federal, state and local environmental regulations. The query-able listing of regulations would include easy-to-understand synopsis interpretations of the environmental regulations together with their original text.

If there is a change in environmental regulations, for example, or the promulgation of a new regulation, COMPONENT managers would also receive an automated notification about the changes that he/she could disseminate to appropriate individuals who could be affected by the regulatory changes.

This capability would be enabled by linking to a third party environmental regulatory monitoring service that is staffed with compliance experts. The interface to this source of information would be seamless and accessible from an environmental manager's dashboard page.

6. Provides cost savings

Through economies of scale, cost benefits would be derived by utilizing a single, centralized ESIS instead of each COMPONENT maintaining numerous compliance and sustainability support systems (Excel spreadsheets, Assess databases, Word documents or smaller web-based applications). The use of multiple software tools could result in high cumulative costs to the Department, especially if many of these tracking and management tools do the same thing. The implementation of one system eliminates this redundancy.

If all the COMPONENTS share one ESIS Tank Module instead of maintaining individual spreadsheets, the ESIS could be easily queried or accessed globally by interested users. From a COMPONENTS point of view, the tank list could be restricted to only the COMPONENTS tanks or a user with higher privileges could see all of the Department's tanks.

Cost savings could also come about from the use of better tracking systems offered by the ESIS. Through the use of business rules that can track days to shelf life expiry, use of the ESIS Hazardous Materials Module, would limit the costs associated with expired shelf-life that would lead to a hazardous materials becoming a hazardous waste. With an automated system tracking hazardous materials inventories, this problem and the associated costs would be limited or avoided. A database of stocked hazardous materials can also be queried before purchases are made to see if excess materials are available.

The use of the ESIS Hazardous Waste Module would also result in potential cost savings from providing a capability to track reimbursables. The Hazardous Waste Module would give large COMPONENTS the ability to charge for waste items that are picked up and disposed, and charge the waste generator.

The ESIS could also assist with cost savings associated with the tracking of solid waste diversion activities. As recyclable waste is collected, it could be weighed and the results could be tracked on the Sustainability Dashboard, indicating progress towards achieving waste reduction targets.

7. Provides high security for environmental work-products.

A centrally-hosted ESIS would provide a high level of security, because security efforts would be focused at one software application instead of on multiple computer desktops or network systems where spreadsheets and documents with environmental products commonly reside.

Although most of the COMPONENTS store documents on network drives, there are users that store work-products on local drives, which present security vulnerabilities. An ESIS with access controlled by user logins and role-based security would limit broad-based access to specific environmental work products (e.g. tank, hazardous materials and asbestos inventories).

The recommended Alternative (Number 4) for implementation of the ESIS also provides for a secure server to store DHS environmental work-products within DHS's network. The other alternatives under this BCA's review would host these work-products outside DHS's protective networks -- on third party servers which could present major security vulnerabilities.

Since the ESIS would use an underlying database, transaction security would also be built into the system so that all additions, updates and deletions are automatically logged. For example, if a COMPONENT user adds a Material Data Safety Sheet (MSDS), the name of the user adding the record and the date would be automatically added to the database. If another user modifies the MSDS record, that users name and date of modification would be automatically posted to the record.

Although the ESIS would use web-based technologies, the implementation of Alternative 4 would require the ESIS to be hosted inside DHS's internal network using an Intranet configuration with external internet access to the ESIS blocked or restricted.

8. Provides real-time access to environmental and sustainability documents and data

As environmental work-products are stored on a central server, access to these items could be quicker than obtaining similar information stored on various network locations or personal computer hard drives. In many cases, work-products stored in these areas have to be search for and if the items do not belong to the requestor, there could be limitations on opening the files. Accessing an ESIS could be quicker and simpler.

Use of the ESIS by DHS-HQ users, for example, would also be enhanced by the ability to query the system globally on a self-service basis to gather key information used to update the Department's Key Performance Indicators (KPIs). The ability to generate self-service reports that collects and aggregates data from multiple sources would also decrease the number of requests for information from DHS-HQ to the COMPONENTS.

COMPONENT users would also be able to create their own queries and reports for data they need. An example report created by a COMPONENT user might be to find the weight in pounds of all recycled material collected during the last 3 fiscal years.

The real-time generation of electronic reports would also reduce the use of paper. After searches for information are completed, reports from the ESIS could be downloaded into electronic PDF format or outputted into Microsoft Excel spreadsheets or Word documents.

9. Provides for customized user management of the Environmental Compliance Portal interface

The software would incorporate a dashboard portal homepage that users can customize according to their needs. For example, if a DHS-HQ user is primarily interested in regularly looking at COMPONENT sustainability charts, the user could add this custom link to his/her homepage dashboard.

Another example would be a COMPONENT user who is only interested in tracking hazardous materials and hazardous waste. The user would be able to customize his/her dashboard to access direct links to the hazardous materials and hazardous waste menus of the ESIS.

The result of this self-service customization would be a user-friendly interface that is more likely to be used over the long term. The self-service customization would also result in efficiencies when users directly access areas of specific interest, focus or responsibility and ignore other areas of the software that may not be needed for that specific user.

The ESIS would also be designed for managers to control access to specific areas of the software based on the user's organization roles. The software would know what role a user plays in the organization, and present appropriate software menus and links tied to the user's organization role.

The results of these features would be an easy-to-use software tool that incorporates self-service customization.

10. Enhances access to environmental Best Management Practices (BMPs) and other resources

In using the ESIS, a DHS COMPONENT that is doing an outstanding job managing a specific area of compliance or sustainability could quickly share this information with interested individuals inside or outside his/her organization. If a specific COMPONENT, for example, has well-written Stormwater Management Plans, this information could be made available to the other COMPONENTS for their use and adoption. This type of sharing would enhance collaborative awareness and teamwork across DHS, facilitating the One-DHS concept.

Environmental compliance and sustainability document templates, instructions, fact sheets, procedures and policies developed by DHS-HQ managers could also be posted to a central location on the ESIS and made available to all COMPONENT users.

To eliminate duplicate storing of BMPs or procedures that already exist on other software systems, the ESIS would also provide the ability to 'hot link' to these documents and data. This would be particularly useful if the maintenance of the documents and data is controlled by different DHS entities.

A DHS-HQ user, for example, could also gather a number of key documents and external links about a new regulatory rule that could be quickly accessed by COMPONENT users.

11. Provides a dynamic annual environmental compliance planner for optional use by users

The ESIS provides a central location within a COMPONENT user's homepages to list their high-level annual environmental tasks. The software would then prompt the user when required actions need to take place. A COMPONENT user, for example, could list his/her annual compliance reports, inspections, and training and through automated email notification reminders and color-coded dashboard pages would be made aware of any actions that are about to come due or are overdue.

COMPONENT environmental managers can also assign tasks to other ESIS users and use the planner to track task completion.

For COMPONENT users at field operation locations, for example, an annual listing of compliance tasks or responsibilities would provide an effective way to manage daily, monthly, weekly, and annual compliance. This feature would be particularly useful in situations where environmental management is an ancillary (or secondary) duty. In these cases, the Compliance Planner could be pre-set with daily, weekly, monthly and yearly requirements responsibilities for that facility. The user would then update the planner when required tasks are accomplished. The assigner of the task (e.g., a COMPONENT manager at headquarters) could then review compliance periodically by viewing task reports that are color coded: green for complete, yellow for scheduled and red for overdue.

The features of the ESIS Compliance Planner would also be important in sustaining institutional knowledge, particularly in organizations where personnel turnover is high. By using this tool, a user assuming new environmental management responsibilities would have a listing of detailed information about how his/her predecessor managed compliance and sustainability on an annual basis.

12. Improves environmental compliance at Smaller Organizations

The ESIS would provide a number of easy-to-use tools to assist the smaller COMPONENTS with non-dedicated environmental staff and budgets to better manage environmental compliance.

The use of the electronic Annual Compliance Planner and Environmental Guides, for example, would provide the users within these organizations with important tools to stay in compliance that they may not have been able to procure and use.

13. Integrates with DHS IT systems like email (Microsoft Outlook).

The ESIS would be able to email compliance-related notifications and reminder ticklers directly into a user's Microsoft Outlook email. If there are situations where a user would not log into the ESIS regularly, the user would still receive ESIS-generated notifications within his/her regularly accessed email.

ESIS users could also post important tasks requirements from the ESIS directly into their Outlook calendars that, like email, are usually viewed daily. If a TRI report, for example, is due on July 1st, an environmental manager at a USCG station could post this requirement from his/her portal planner directly into his/her outlook calendar and serve as an active reminder within the active mailing system that is commonly viewed daily.

14. Provides numerous advantages over storing and managing data in desktop system applications (E.g. Microsoft Excel spreadsheets).

It is not uncommon for environmental managers to maintain a large number of spreadsheets to manage compliance. There are problems with this practice. If there is turnover, for example, and the spreadsheet owner leaves the organization, it may not be easy for his/her successor to find and fully understand the spreadsheet. If multiple worksheets are linked, this compounds the problem. ESIS software provides applications that are usually easier to understand than complicated tracking spreadsheets, so when there is turnover, the successor can quickly pick up from where his/her predecessor left off.

Another example of an ESIS advantage over spreadsheets would be in the development of a GHG inventory for a COMPONENT organization that could be recorded on several worksheets linked to a summary workbook. Within an ESIS, all the data is typically stored and updated at one place.

Consolidating information traditionally tracked in a number of spreadsheets into a single ESIS could cut redundancies. Once specific data is entered into the ESIS, the resulting information can be automatically used in other applications and reports. For example, chemical usage data stored in the hazardous materials module could be used to generate Sara 313 TRI reports, as well as providing information that goes into the following reports: annual emission inventory; biennial hazardous waste, NESHAP, and 12 month rolling air permit reports.

Mandated greenhouse gas (GHG) calculations, for example, may need to pull data from various sources, including stationary combustion, mobile, energy/utilities and water. An ESIS system could automatically pull data from these sources, in addition to performing calculations to create facility and corporate summary reports. Creating this type of capability with spreadsheets could be difficult.

Desktop tools may be commonplace and useful to many organization workers, but they are often inaccessible to large numbers of people. When applications or files are installed on a desktop,

access to these files is usually limited to the owner of the document and computer. The ESIS provides an organization with an efficient way to share key environmental compliance work-products.

Storing environmental documents and data within the ESIS, instead of on individual desktops could also minimize the loss or corruption of files and data. Although most COMPONENT users place key documents on network drives that are backed up, it is not uncommon for environmental work-products to be stored on desktops that risk corruption or complete loss of access to the files following computer switchovers.

Desktop software forces users to act as systems administrators. In these instances, the users of the files need to know how the data was set up and what special features have been added to these files (e.g. macros and scripts). Within an ESIS, the automation is usually documented, so that new users can quickly understand how calculations are made.

Disadvantages of spreadsheets compared to a Web-Based ESIS	
Spreadsheets	ESIS
The author of the spreadsheet can work through the spreadsheet easily, but not necessarily other users of the files or users who may replace the author.	An organized, simple and user-friendly interface is provided to the user. When a user leaves the organization, successors can continue working with the application and stored work products.
Spreadsheets have a maximum number of rows for data to be stored. In Microsoft Excel it is 60,000.	One Oracle database can store several terabytes of data records.
Environmental reporting over time often leads to a large amount of data, which becomes difficult to manage using spreadsheets. Large spreadsheets can also become slow and difficult to maintain.	Data stored in databases that can store millions of records is much easier to maintain, even if the database grows significantly over time without any deterioration in access.
Spreadsheets are usually not secure.	The ESIS would have security features that limit access based on user roles and password credentials.
Corrupt files, crashed files or deleted files can cause serious problems if files are not regularly backed up.	The ESIS would be backed up daily.
Spreadsheets may not have field validation built into them which could affect the quality of data added to them.	An ESIS would provide field data entry validation. Required fields would have to be added for the record to be successfully saved. If a user tries to enter data in the wrong format (e.g. trying to add a word into a date field) the ESIS will not allow the information to be added.
Spreadsheet files may be stored in multiple locations and not easily accessible.	Files in an ESIS are centralized and easy to access. If auditors, for example, need access to data or documents, this type of information stored within the ESIS could be quickly found.

15. Provides compatibility with current DHS architecture and Database Requirements.

The ESIS would be programmed in Microsoft’s DOT.NET Framework and use an Oracle 9 or 10g database) which are approved DHS application tools.

16. Provides the advantage of using one central database.

The ESIS provides efficiencies by using one database. If a facility within one of the COMPONENTS, for example, uses a particular chemical that is also used by other organizations, information could be entered once and then shared. For example, in the Hazardous Materials Material Safety Data Sheet (MSDS) module, an MSDS for 'WD-40' would only have to be entered once, instead of multiple times.

Centralized data in one ESIS database would also be easy to secure and backup. Data on various computers or networks would be more difficult to secure and backup.

17. Provides DHS with the 'Best of Class' software capabilities.

An ESIS, whether designed or procured by DHS, would provide the Department with the best software capabilities for environmental compliance and sustainability currently on the market (inside or outside government).

During the design phase of the ESIS, the Department would be able to select the best Commercial-off-the-Shelf (COTS) capabilities and use this platform as a basis to add DHS- or COMPONENT-specific requirements that would result in a robust ESIS.

18. Allows ESIS software changes, updates and improvements to be made instantaneously.

Desktop updates to hundreds of software applications could be difficult if done one computer at a time, or even if pushed through the DHS network. With a server-based ESIS, a change or update on the server would be instantly available to end-users.

Software problems (bugs) could also be promptly fixed, instead of sending software patches to the end user, often on a delayed basis.

The ESIS software would be kept up-to-date with real-time updates and improvements. Bulk updates to the software (e.g., the import of large amounts of legacy data) could be done during down times (e.g., weekends).

It is assumed that the ESIS would always be up-to-date to the latest release, without requiring the user to take extensive upgrade actions or the need to interfere with the user's work. Web-based applications do not have to be downloaded, installed or configured. This type of capability is particularly important when regulations change. If a new set of EPA hazardous air pollutants (HAPs) are introduced, these changes could be quickly updated in the ESIS and made available to all ESIS users.

With the ESIS located on a single server, customizations could also be designed and rolled out quickly. If DHS COMPONENTS, for example, wanted to add a new field to a tank database or a new report added to the HazMat module, these additions could be made quickly and after testing, could be posted to the production server for immediate access and use.

19. Standardizes software quality assurance across the DHS enterprise by using one environmental management system.

Using a single ESIS system would make the standardization of quality an achievable goal for DHS since all the COMPONENTS use the same system. By entering the same types of inputs, the same types of outputs would result. There would not be situations where some of the COMPONENTS have excellent data for air inventories, for example, while other COMPONENTS have a sub-standard set of similar information. With the use of required data entry fields and pre-specified field types, a consistent standard of quality data would be added into the system by all users.

If the EPA or state regulations require hazardous materials constituent quantities to be in pounds, the system would use controls to prevent users from adding kilograms or metric tons.

Another example would be the addition of liquids into the Hazardous Materials Module. Whenever liquids are added to this module, the user is required to also add the liquid's Specific Gravity. The ESIS would automatically prompt users for this entry before the data is committed into the database which protects the quality of data and assures the correct results if calculations are then made from the data.

20. Requires no special configurations or changes on user computers.

Access to the ESIS and its environmental work-products would only require a common Microsoft Explorer Browser, which all computer users within DHS have. Users would not need to download software to their desktop computers to use the ESIS.

21. Reduces the risk of lost environmental documents and data with automatic ESIS database backups.

When users use the ESIS, documents and data would be stored on a central server. Automatic backups would be done daily, and copies would also be stored at a secure off-site location at least once-a-month. Regular backups would reduce the risk of computer crashes and virus attacks that could erase or corrupt key files stored on desktop computers.

A server administrator would conduct daily backups in addition to performing other routine maintenance tasks such as installing security updates, ensuring that the server is up and available at all times, monitoring bandwidth and server loads.

22. Provides secure access to the ESIS from wherever COMPONENT users are located.

COMPONENT users will be able to access the ESIS whenever the DHS Intranet is available. If, for example, there were instances where CBP COMPONENT user of the ESIS travels, access to the ESIS would be available wherever the DHS network is available.

23. Provides links and connectivity to other DHS systems.

Within the design of the ESIS, links could be made to other DHS or COMPONENT systems. If, for example, there is a need to pull or link to the USCG or CBPs SAP Real Property System data, this capability could be accomplished within the open connectivity data structure of the ESIS.

Since the software would be hosted inside DHS, data could be shared with existing DHS legacy systems or other enterprise applications with non-environmental functions that have useful data for supporting environmental sustainability and compliance.

24. Provides general benefits that are characteristic of web-based applications.

- Web-based applications, such as the ESIS, are less prone to crashing or creating technical problems because of software or hardware conflicts that often plague desktop computers.
- Web-based applications, such as the ESIS, could also sustain multiple users at one time. If a number of users need to collaborate around a specific set of information (for example, reviewing environmental audit findings, all of the users can log into the ESIS and access the audit report and discuss its content over a teleconference.

Section 3. Current State Assessment and Future ESIS Vision

The following narrative describes the current DHS state of operations and future DHS vision for a planned enterprise ESIS.

3.1 Current State Assessment

3.1.1 Current State Operations

DHS COMPONENTS currently use a variety of software tools to help manage sustainability and environmental compliance. The following systems are used:

1. Manual paper-based systems.
2. Standard Microsoft Office products like Word documents, Excel spreadsheets, and Access databases. Some COMPONENTS use Microsoft SharePoint for document management and basic list-building tasks.

3. A variety of web-based applications geared towards specific environmental requirements, such as CP-Track which is used by a number of the COMPONENTS for compliance auditing or the NEPA software used by DHS HQ.

At the present time there is no centralized database in use across DHS that supports the broad sustainability and environmental compliance needs for all COMPONENTS. However, one tool however, that comes close to this goal is the EnviroManager software used by the USCG.

3.1.2 Accountability and Standards

The management of sustainability and environmental compliance is driven by a number of environmental regulations and requirements which include the following:

- Clean Air Act (CAA) (1972)
- Discharge Monitoring Reports (DMRs) (1985)
- Hazard and Solid Waste Amendments (1984)
- Waste Manifests (1980)
- Biennial Reporting (1983)
- Emergency Planning and Community Right to Know (EPCRA) and the Superfund Amendments and Reauthorization Act (SARA), (1986)
- Hazardous Chemical Inventory (1987)
- Toxic Release Inventory (TRI) Reporting (1988)
- Clean Water Act (CWA) Amendments (1990)
- Maximum Achievable Control Technology (MACT) air compliance (2003)
- New Source Review (NSR) and Prevention of Significant Deterioration (PSD) Permitting (1975)
- Various Executive Orders (e.g., 13423)

As a result of many environmental requirements with their potential for consequences for non-compliance, there is a need for software tools to assist the Department with the compliance with applicable laws and regulations.

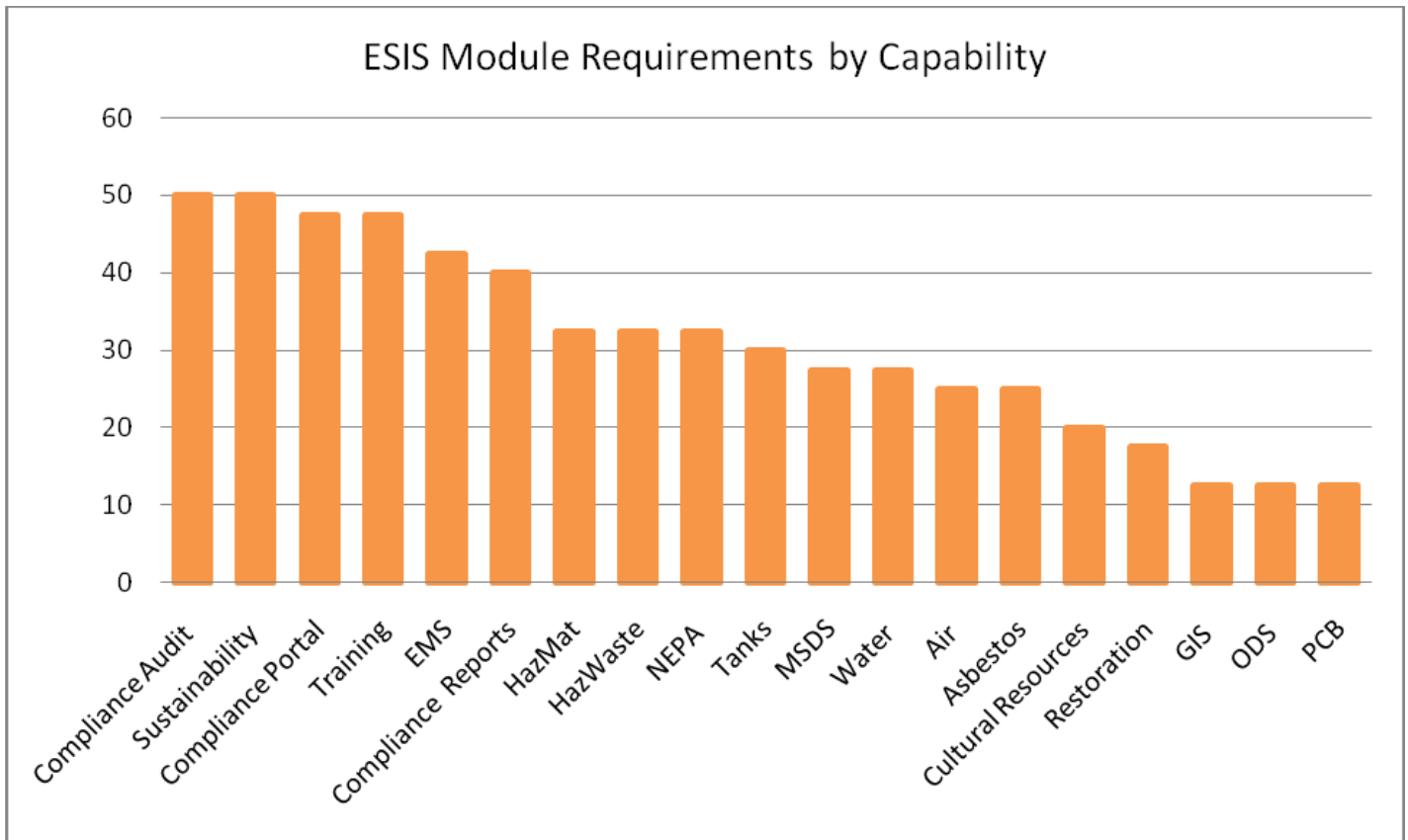
3.2 DHS Future ESIS Requirements and Vision

3.2.1 ESIS Requirements

During the COMPONENT interviews, the need for specific tools to assist with compliance and sustainability was evaluated. The results from the Software Needs Analysis were prioritized and plotted in Chart 1.

Compliance tools with the highest scores were interpreted to have a greater demand than tools with lower scores. The maximum score attainable for each compliance category was 60.

Chart 1 – ESIS Requirements by Capability



The results from the interviews show that an integrated ESIS with a comprehensive set of tools would provide significant benefits over the current state of operations, and serve to improve environmental sustainability, compliance and performance.

3.3 Proposed ESIS Software Modules

The ESIS would include a number of software tools to assist with environmental compliance and sustainability management. The COMPONENT selection to use the available software modules would be driven by environmental regulations that require specific information (documentation and data) to be accurately recorded, reported and maintained to prove compliance. There would also be tools that DHS-HQ would require use (e.g., the Sustainability Portal that would be used to manage the data call process).

A summary of the general capabilities, features, and benefits for each of the proposed ESIS software modules is listed below:

1. Sustainability Portal and Best Practices Repository	
<p>This module would be used to track and manage high-level sustainability metrics (e.g., DHS Environmental Scorecard and environmental data-calls). With a single, integrated system in use by DHS to store sustainability information, it would be possible to routinely query or aggregate sustainability data by COMPONENT, location, region or DHS-wide, to generate sustainability reports that include dynamic graphs and charts.</p> <p>The ESIS would also include a central repository to post Best Management Practices that can be used by all the COMPONENTS.</p>	
Features	Benefits
<ul style="list-style-type: none"> ➤ Host sustainability metrics data. ➤ Manage Data Calls. ➤ Display results from data calls in dynamic graphs and charts. ➤ Provide a reports generator. 	<ul style="list-style-type: none"> ➤ Provides engaging views of sustainability goal progress. ➤ Provides dynamic color-coded scorecards ➤ Automates electronic data collection from COMPONENTS. ➤ Users can create their own customized reports.

2. ISO 14001-based Environmental Management System (EMS)	
<p>This module would be used to implement, manage and sustain COMPONENT EMSs. All 'appropriate' federal organizations are required to have an EMS per Executive Order 13423 (and subsequent orders). This module would provide a repository for COMPONENTS to host their EMS work-products and have them available for ongoing management actions and audits (that are typically conducted annually).</p>	
Features	Benefits
<ul style="list-style-type: none"> ➤ Tool to manage all elements of an auditable ISO 14001-conformant EMS. ➤ Stores EMS work products (documents and data). 	<ul style="list-style-type: none"> ➤ Meets Executive Order and DHS requirements to have a maintained EMS in place. ➤ Provides a tool to track annual progress on EMS Objectives and Targets and assure continual improvement. ➤ Includes an EMS Sustainment sub-module assures ongoing maintenance of the EMS.

3. Environmental Compliance Auditing	
<p>This module would be used to manage environmental compliance audits. COMPONENT users of the software would use the module to schedule audits, manage audit checklists, record audit findings, and manage compliance resolutions.</p>	
Features	Benefits
<ul style="list-style-type: none"> ➤ Manage the complete environmental audit process: <ul style="list-style-type: none"> ○ Schedule audits ○ Provide customizable environmental compliance checklists ○ Record findings ○ Resolve findings ○ Providing a knowledgebase of common findings 	<ul style="list-style-type: none"> ➤ Includes customizable compliance checklists or COMPONENTS can load standard checklists into the software. ➤ Findings can be queried by risk criteria (e.g., show me all the findings that could lead to NOVs). ➤ Provides the ability to review the closure or resolution status of audit findings and quality of corrective actions.

4. Annual Compliance Requirements Management Portal	
<p>This module would be used by COMPONENT users to list high-level annual compliance requirements and associated tasks. Examples of listed requirements could include annual environmental monitoring activities associated with periodic water sampling that is part of the National Pollutant Discharge Elimination system Discharge Monitoring or the need to take an annual refresher Hazwoper training course.</p> <p>The portal provides facility-level organizations with an Annual Compliance Planner that allows users to make sure that their required regulatory activities (e.g., reports) are always up-to-date or that event-driven actions (like routine inspections or training) are carried out on schedule.</p> <p>The module would also include a document management capability to store compliance documents (e.g., Management Plans, Permits, Standard Operating Procedures) and records (e.g., key correspondence with regulators demonstrating compliance).</p>	
Features	Benefits
<ul style="list-style-type: none"> ➤ List annual environmental compliance requirements. ➤ Store compliance documents and records. ➤ Generate Email alert notifications (due-date reminders). ➤ Automatically journalize compliance actions. In subsequent years, users can review how environmental compliance actions were carried out. 	<ul style="list-style-type: none"> ➤ Tracks completion of important requirements with color coded (traffic lights for scheduled, completed, not completed). ➤ Attaches documents associated with conducting listed compliance requirements. ➤ Posts automated reminders into Microsoft Outlook Calendar and Email. ➤ Incorporates permits compliance tracking.

5. Compliance Guide Management and Regulatory Listing Library

This module includes a feature used by the USCG called Unit Environmental Guides (UEGs). UEGs are short guides (usually not longer than five pages) that document how an environmental manager should manage compliance on a day-to-day basis at his/her organization. The guides are similar in function to Turnover Books, which describe how various compliance activities should be carried out if a person in charge of environmental management leaves his position and hands over responsibility to a new manager. The new manager would have the benefit of a site-specific guide of how to manage compliance.

The Environmental Guides are typically used by small field organizations to highlight key annual tasks and regulatory requirements that need to be managed. Larger organizations tend to use a number of management plans.

The guides can be controlled, so that changes are made with appropriate approvals and that older guides are archived for future reference. The software also includes a Regulatory Listing Library, which provides a reference of all the key federal and state environmental regulations. The actual regulations text is listed together with easy-to-understand interpretations of the regulations. This feature is provided as a resource to environmental managers.

Features	Benefits
<ul style="list-style-type: none"> ➤ Provides site-specific environmental compliance guides available to COMPONENT users. ➤ Provides a listing of Federal, State and some Local environmental regulations that can be queried. ➤ Provides notifications of new regulatory updates with easy-to-understand descriptions of the changes. 	<ul style="list-style-type: none"> ➤ Provides new managers with the answer to: "How do I manage environmental compliance and sustainability at this facility?" ➤ Provides a short electronic book of how to manage specific compliance issues (E.g., What do I need to do to send my waste to DRMO? Or what is a CLIN?). ➤ Provides a "Turnover Book" for personnel that move into new positions. ➤ Provides a database of updated Federal, State and some Local environmental regulations.

6. Tank Inventory Management

This module would be used to manage key information about regulated underground storage tanks (USTs) and above ground storage tanks (ASTs) that are included in Spill Prevention, Control and Countermeasure (SPCC) plans. Information in this module would include tank characteristics, protection features, operational controls, tank contents and volume, potential spill paths to water bodies and closure information (if applicable).

Features	Benefits
<ul style="list-style-type: none"> ➤ List tank features, protection characteristics, closure status. ➤ Attach compliance documents or notes related to a specific tank. ➤ Attach tank pictures. ➤ Journalize ongoing Operations and Maintenances activities. 	<ul style="list-style-type: none"> ➤ Access comprehensive information about regulated tanks. ➤ Assist with the management of SPCC requirements.

7. Cultural, Archaeological and Historical Resources Management

This module assists COMPONENTS with the management of requirements associated with the National Historic Preservation Act and other federal, state and local regulations associated with cultural, archaeological and historical assets that need to be protected. This module would include site information, pictures and notes on correspondence with State Historic Preservation Officers (SHPOs) and other regulatory personnel.

Features	Benefits
<ul style="list-style-type: none"> ➤ List key cultural, archaeological and historical: site documents, data and pictures. ➤ Journalize ongoing Operations and Maintenances activities. ➤ Include the ability to document consultations with regulators (e.g. SHPO) and other interested parties. 	<ul style="list-style-type: none"> ➤ Provides a detail listing of regulated cultural, archaeological and historical items that require protection. ➤ Allows for the integration of historic, archaeological and cultural considerations in COMPONENT planning and management activities.

8. Asbestos Inventory Management

This module would be used to store Asbestos survey information and provide Operations and Maintenance (O&M) tracking tools to minimize the risks associated with workplace asbestos. The software would record the location of suspected or actual asbestos. The module would also help the COMPONENTS with asbestos-related O&M activities that assist with general worker-related safety.

Features	Benefits
<ul style="list-style-type: none"> ➤ Lists asbestos containing materials and condition. ➤ Stores key asbestos survey documents and results. ➤ Stores asbestos survey pictures. ➤ Journalizes ongoing Operations and Maintenances activities to include inspection logs. 	<ul style="list-style-type: none"> ➤ Helps to minimize the occupational exposure to airborne asbestos fibers by listing asbestos containing locations and conditions. ➤ Allows for the scheduling of periodic audits of areas where there is a risk of asbestos deterioration.

9. Hazardous Materials Management and Chemical Compliance Assurance

This module would be used to manage hazardous material amounts, locations and hazard characteristics for COMPONENT organizations that require Emergency Planning and Community Right-to-Know (EPCRA) Tier II and Toxic Release Inventory (TRI) reporting. The software would help COMPONENTS to accurately generate SARA Title III reports. To do this, the software would track pure and mixed chemicals and provide detailed reports on where hazardous materials are located and in what quantity they are used.

This module would also include a Compliance Assurance Matrix section which compares the amount of specific chemicals used at a facility to various regulated threshold lists (e.g., what Hazardous Air Pollutants are used at this facility?). Appendix 5 contains a chart highlighting the Compliance Assurance Matrix capabilities of this module and the associated regulatory framework.

Features	Benefits
<ul style="list-style-type: none"> ➤ List all products with hazardous chemicals stored/used at a COMPONENT facility (provides a hazardous substances inventory). ➤ Maintain an Authorized Use List (AUL) of hazardous chemicals to control the acquisition and use of these chemicals. ➤ Integrates with the MSDS Module which meets Occupational Health and Safety Administration (OSHA) Hazard Communication (HazCom) requirements. ➤ Generates bar code labels to put on hazardous materials. ➤ Includes EPA's List of List hazardous chemicals, in addition to other regulatory lists. 	<ul style="list-style-type: none"> ➤ Facilitates Pollution Prevention initiatives (e.g., what extremely hazardous chemicals do we use and how much?). ➤ Assures chemical compliance with a number of key environmental laws (e.g., EPCRA, TSCA and RCRA). ➤ Provides quick access to MSDSs (even from remote locations). ➤ Assists with the submission of Tier II and TRI reports. ➤ Assists with the management of Affirmative (Green) Procurement programs. ➤ Assists with the implementation and management of waste minimization strategies targeting reductions in the amounts and toxicity of used hazardous materials. ➤ Assists with the management of reportable releases of oils and other hazardous substances.

10. Hazardous Waste Management

This module would be used to document COMPONENT organization waste disposal processes for facilities that generate more than 500 pounds of Resource Conservation and Recovery Act (RCRA)-managed waste.

The software would standardize waste characterizations across the enterprise; track waste streams from cradle-to-grave; simplify manifest and DD-1438 creation; and simplify Treatment, Storage and Disposal (TSD) facility tracking.

The software would also help COMPONENTS manage the time constraints associated with hazardous waste storage that varies depending on the facility's regulated generator status.

The software also allows organizations to financially charge generators for the waste that they produce. This provides a powerful incentive to reduce generated waste.

Features	Benefits
<ul style="list-style-type: none"> ➤ Cradle-to-grave waste tracking. ➤ List hazardous waste stored at a facility. ➤ Track the length of time waste is stored. ➤ Manage Waste Profiles (Characterizations). ➤ Generate government waste manifests and DRMO DD 1348 forms used to dispose waste. ➤ Generates bar code labels to put on waste items. 	<ul style="list-style-type: none"> ➤ Tracks generated and stored hazardous waste. ➤ Assure that stored waste is disposed on-time (e.g. before 180 days restrictions). ➤ Assist with hazardous waste minimization programs. ➤ Allows organizations to charge generators of the waste they generate and incentivize waste reduction efforts.

11. Environmental Compliance Training Management

The WebTrainer module provides a tool to present and manage environmental compliance training that can be appropriately taken online. Traditional classroom learning can be very expensive (requires trainers, training buildings, materials, etc.) This module would host up to 50 primary Environmental Training Modules that could be customized by COMPONENTS before being made available.

The software would also automatically document compliance training by recording who took the training and when they took it. The WebTrainer module is particularly effective in instances where there is a high turnover of personnel (e.g. uniformed service men and women in the USCG get rotated often and serve short tours of duty). The software would provide a new person on site with a list of required training that can be done whenever there is down time.

The software also provides training reminders and reports to managers that serve to ensure that employees or personnel working at COMPONENT organizations receive appropriate training before starting a new job or undertaking a specific assignment that could involve hazardous operations. The software could also provide notices of required refresher courses.

It should be noted that this module would co-exist with regular standup training or training received outside the organization. Some training also requires hands-on activities (e.g., access to PPE) that would not be appropriately done in an online course.

Features	Benefits
<ul style="list-style-type: none"> ➤ Provides a list of environmental compliance training that can be effectively delivered online). ➤ Documents who took the training. ➤ Includes interactive tests. ➤ Provides automatically generated Certificates of Completion. ➤ Assign local managers to track local training. ➤ Track training needed by location or department. ➤ Access history of completed training. 	<ul style="list-style-type: none"> ➤ Tracks training by organization, location, course, department and job title. ➤ Provides self-service registration of training that cuts down on training administration. ➤ Includes training reminders for individuals who are scheduled to take training. ➤ Quickly print 'Training Done' and 'Training Due' reports. Export training results to Excel. ➤ Allows for the establishment of course preferences (e.g., passing grade, open enrollment windows, and retraining due dates).

12. MSDS Management

This module is used to manage Material Safety Data Sheets for environmental and occupational health requirements.

Features	Benefits
<ul style="list-style-type: none"> ➤ List all MSDSs. ➤ Incorporates key MSDS data. ➤ Attaches MSDS document to the ESIS data record. ➤ MSDS search features – By product name, manufacturer, facility where used, by common name. 	<ul style="list-style-type: none"> ➤ Information collected from MSDS feeds into the HazMat Module (e.g. Chemical constituents). ➤ The HazWaste Module also links waste items to MSDSs. ➤ Includes new product approval process where environmental, occupational health and safety managers are required to approve new MSDSs and associated products before purchasing actions.

13. Air Management	
<p>This module would be used to assist COMPONENT organizations that maintain Title V air permits that are part of the Clean Air Act (CAA). The module would be used to inventory and document all permitted emission sources. The module would also track the completion of permit-driven tasks.</p>	
Features	Benefits
<ul style="list-style-type: none"> ➤ Lists and tracks all permitted air sources, emissions and limits. ➤ Lists permitted control requirements. ➤ Stores emission calculations derived from permits and other sources. ➤ Provides a record of any deviation from air permit limits and requirements. 	<ul style="list-style-type: none"> ➤ Tracks compliance with air permits requirements (such as on-going monitoring). ➤ Assist with CAA Title V compliance report preparation (e.g. monthly rolling averages of emissions). ➤ Produces VOC, HAP and other emission reports.

14. Water Management	
<p>This module would be used by COMPONENT organizations that maintain National Pollutant Discharge Elimination System (NPDES) or State Pollutant Discharge Elimination System (SPDES) permits that are part of the Clean Water Act. The module would be used to inventory and document all permitted outfalls and track the completion of permit-driven tasks.</p>	
Features	Benefits
<ul style="list-style-type: none"> ➤ List all permitted water outfalls. ➤ The module would also track completion of permit-driven tasks. ➤ Tracks discharges and pollutant limits. 	<ul style="list-style-type: none"> ➤ Supports compliance with the Clean Water Act and NPDES and SPDES requirements. ➤ Assists with the generation of Discharge Monitoring Reports (DMRs).

15. Green House Gas Emissions Management	
<p>This module would be used by organizations wishing to establish and track their GHG footprint and also support required regulatory GHG accounting, recordkeeping and verification requirements.</p> <p>The Environmental Protection Agency (EPA) recently released the EPA Rule on Greenhouse Gases which requires specific organizations to inventory their GHG emissions sources and report Carbon Equivalent totals on an annual basis.</p>	
Features	Benefits
<ul style="list-style-type: none"> ➤ List Green House Gas Emission Sources (permitted and non-permitted). ➤ Calculate GHG and Carbon Equivalent emissions. ➤ Generate reports that verifiers can use to audit the published annual results. 	<ul style="list-style-type: none"> ➤ Tracks compliance with GHG Emissions requirements (EPA Reporting Rule 2010) and Executive Order 13514. ➤ Generates reports that can be used by COMPONENTS to monitor reduction progress.

16. Geographic Information System (GIS) Viewer Portal	
<p>This module provides a lightweight, web-based GIS map-based portal which would allow COMPONENTS to quickly link to assets that have environmental impacts or important environmental considerations. A user could typically browse to the DHS Environmental Map and launch a query that asks: "Show me the location of all the USCG large quantity generators?" The map would then return a map tagged with these sites around the country. The user could then click on one of these sites and drill down to specific information about that site.</p>	
Features	Benefits
<ul style="list-style-type: none"> ➤ Provides GIS Maps linked to key environmental assets. 	<ul style="list-style-type: none"> ➤ Provides a powerful map-based search capability with drill-down-into-the-underlying-data capability.

17. Polychlorinated Biphenyls Polychlorinated Biphenyls (PCB) and Ozone Depleting Substances (ODS) Inventory	
<p>These modules would give COMPONENTS the ability to store PCB and ODS inventory data for the assets they maintain that contain these chemicals. The PCB module assists with the compliance of the Toxic Substances Control Act (TSCA). TSCA regulates PCBs, radon, and asbestos, requiring testing of chemical substances entering the environment and regulating releases. The ODS module assists with the compliance of various Executive Orders and federal air pollution requirements.</p>	
Features	Benefits
<ul style="list-style-type: none"> ➤ Lists all equipment that has PCBs. ➤ Records PCB spills. ➤ Lists all equipment that has ODSs. ➤ Journalizes ongoing Operations and Maintenances activities to include inspection logs. 	<ul style="list-style-type: none"> ➤ Helps COMPONENTS track and reduce the use of equipment with PCBs and ODSs.

The capabilities of each the modules listed above would be closely evaluated by a DHS team during the Requirements Definition Phase of the ESIS implementation to ensure that the selected modules meet DHS’s sustainability and environmental compliance requirements. It is assumed that during this process, key DHS managers, senior compliance experts and end-users would be involved in this process and that their input would also be considered once the ESIS is stood up before adding new requirements or features aimed at continually improving the modules.

It is expected that the use of some of the software modules proposed for the ESIS would be mandatory. An example of a module’s mandatory use would be a COMPONENT that maintains a Title V Air Permit, which may require the need to track emissions against pre-determined regulatory thresholds.

It is also expected that a number of modules would be provided for use by COMPONENTS on an optional basis.

Table 2 provides an overview of proposed 'mandatory' and 'optional' modules that would be made available for COMPONENT use.

Table 2 – Proposed Required and Optional Use of ESIS Modules

Software Module	Required Use By	Optional Use By
Sustainability Portal and Best Practices Repository	All COMPONENTS	
ISO 14001 EMS	All COMPONENTS that are part of the appropriate facilities list.	Other COMPONENTS
Environmental Compliance Auditing	All COMPONENTS	
Compliance Requirements Portal		COMPONENTS
Compliance Guide Management and Regulations Library	All COMPONENTS	
Tanks Management	Only COMPONENT facilities that have regulated USTs and ASTs included in SPCCs	Other COMPONENTS
Cultural, Archaeological and Historical Resources Management	Only COMPONENT facilities that have regulated Cultural, Archaeological or Historical Resources.	Other COMPONENTS
Hazardous Materials Management	Only COMPONENT facilities that have Emergency Preparedness and Community Right to Know (EPCRA) Tier II and/or Toxic Release Inventory (TRI) reporting requirements.	Other COMPONENTS
Hazardous Waste Management	Only COMPONENT facilities with regulated Resource Conservation and Recovery Act (RCRA) Waste that are Large Quantity Generators.	Other COMPONENTS
Air Management	Only COMPONENT facilities that have Title V Reporting requirements or that participate in their air compliance State Implementation Plan (SIP).	Other COMPONENTS
Water Management	COMPONENT facilities that have a National Pollutant Discharge and Elimination System (NPDES) or State Pollutant Discharge and Elimination System (SPDES) Permit	Other COMPONENTS
Environmental Compliance Training	All COMPONENTS for specified training.	Other COMPONENTS
Green House Gas Emissions Management		COMPONENTS
Asbestos Inventory Module		COMPONENTS
Polychlorinated biphenyls (PCB) Management		COMPONENTS
Ozone Depleting Substances (ODS) Management		COMPONENTS
Web Geographic Information System (GIS)		COMPONENTS

3.3 ESIS Implementation Best Practices

The following best practices have been observed during implementations of large federal management systems:

- User needs are clearly identified early in the development life cycle.
- Users are provided with adequate training.
- The software is designed to be easy-to-use and navigate.
- Top management support is obtained early in the system evaluation process and sustained through the life of the system's use.
- Importing legacy data is completed before 'going live'. The initial users of the system have the benefit of working with real data.
- A fast-moving, ramp-up process is used leading to quick adoption.
- A readily available Help Desk is provided to answer users' questions.

3.3 DHS Top Management Support Requirements

Successful software implementation requires a combination of leadership, stakeholder support and long-term executive commitment. As primary sponsors, top DHS management would need to articulate the value-proposition offered by the ESIS and communicate its expected outcomes to the user community.

One of the first requirements of top management is to craft a policy that addresses the systems goals and use expectations.

In addition to active top management support, selected DHS end-users involved with day-to-day environmental management, together with COMPONENT subject matter experts, would need to be involved in the ultimate design and deployment process. As key users participate in the implementation of a solution they support, the chances of success are much greater. A Functional User Group (FUG) will be established to make sure that key requirements identified by management, end users, and subject matter experts are incorporated into the ESIS.

There would also be recognition that there could be obstacles to the implementation of the ESIS that is common to any changing process. It is expected that a clear communication of benefits by upper management will be used to engage skeptics together with the incorporation of positive input into the ESIS design.

3.3.1 Programmatic Requirements

DHS is expected to put a number of programmatic requirements (e.g., policy documents) in place to implement and maintain the ESIS. These would include:

1. Providing a clear, written policy on the rationale behind the use of the software. The policy would also state what modules are required to be used by COMPONENTS and which modules are optional.
2. Committing funding to the ESIS for the proposed eight-year life cycle period. A consistent, uninterrupted funding stream would be required to successfully maintain the ESIS.

3.3.2 Project Staffing

DHS would provide high-level management and additional labor support (either in-house or contracted) to maintain the ESIS. It is expected that the following labor resources would be needed to establish and maintain the ESIS.

1. A senior DHS manager who would chair software user group meetings and facilitate the resolution of COMPONENT issues and communicate any proposed changes to the software support team. The manager's time would initially require full time attention (First Year) and then decrease over the years as the ESIS matures
2. A support staff person would be needed to assist the senior DHS manager with ongoing software maintenance coordination.

3.4 DHS ESIS Implementation Technical Requirements

The proposed ESIS would include a number of technical requirements.

3.4.1 The specific primary technical requirements are:

- Approval to use Oracle 10g database. Oracle 9 is the current level of the enterprise database that is currently approved for use within DHS.
- Use of .NET technologies to program the front end use interface of the ESIS.
- Single-sign-on access to the portal using an Internet Explorer browser. Only users with credentials to log into the DHS network would have access to the ESIS.
- There would be interfaces with Microsoft Outlook Email and calendar capabilities.

3.4.2 Technical personnel requirements include:

1. An Oracle database administrator (DBA) /Application Administrator (AA) of 1 Full Time Equivalent (FTE) (initially). Following year 3 of the deployment this need could be decreased to a half-time FTE. This support could be provided by a contractor.
2. A dedicated helpdesk support person (one FTE) who would support the Help Desk during regular day time business hours. This support could be provided by a contractor.

Section 4. Gap Analysis (Comparison of Current to Future State)

The BCA uses a gap analysis to present the ideal outcomes or end states that an implemented DHS-wide ESIS would provide and contrast them with the current “As Is” situation.

Table 3 presents a Gap Analysis that compares tools that are currently used to support compliance and sustainability to what the future state might be if an enterprise ESIS were implemented.

Table 3 – ESIS Module Capability – Current and Potential Future State

Tool/Module	Current Use/Availability	Potential Future State
Sustainability Portal and Best Practices Repository	Emailed Microsoft spreadsheets and Word documents.	Web-based access to Sustainability Metrics and BMPs
ISO 14001 EMS	Mixed. Word and Excel documents. Some documents are stored on SharePoint systems.	Web-based access to all EMS work-products
Compliance Auditing	Mixed. Use of CP-Track, spreadsheets and word documents.	Web-based access to Environmental Compliance Audits (scheduling, checklists, findings, resolutions)
Compliance Requirements Portal	Mixed. High level annual compliance requirements may be listed on Excel spreadsheets. Management plans, SOPs and BMPs are in paper-based and electronic document files.	Web-based access to list of high-level annual compliance requirements with links to key compliance documents centrally posted.
Compliance Guide Management	Mixed. High level requirements may be listed on Excel Spreadsheets. Management guides, SOPs and BMPs are in paper-based and some electronic document files.	Easily accessible list of compliance requirements would be listed on a web-based portal with access to key compliance documents centrally posted.
Tanks Management	Mixed. Tank inventories are typically listed in Excel spreadsheets and Access databases, with SPCCs managed in Word documents.	Listed in a web-based system.
Cultural and Historical Resources Management	Cultural resource inventories are typically listed in Integrated Cultural Resources Management Plan (ICRMP) documents.	Listed in a web-based system with electronic references and links to appropriate documents.
Hazardous Materials Management	Mixed. Use of Access databases and spreadsheets.	Web-based management of MSDSs, list of chemicals stored, with chemical transactions to prepare year-end compliance reports.
Hazardous Waste Management	Use of Access databases, paper-based systems and spreadsheets.	Web-based system for waste characterizations, waste storage information, and manifest creation.
Air Management	Excel Spreadsheets. Paper-based permit documents. Word documents.	Use of web-based system to list emission sources, emission transactions and track permit action tasks (many of which are data sensitive).
Water Management	Excel spreadsheets and word documents.	Use of web-based system to list outfalls and track permit action tasks (many of which are data and date sensitive). Document storage of sample reports.

Environmental Compliance Training	Mixed. Stand up training, PowerPoint, some Web-based training.	Access to key environmental training that is appropriately delivered over a web-based application. Automated management features such as self-registration, certificate generation and record-keeping.
Green House Gas Emissions Management	Excel spreadsheets.	Listing of GHG sources in web-based application that calculates Carbon Equivalents (GHGs) and presents reports with graphs and charts.
PCB Management	Excel spreadsheets.	Web-based listing.
ODS Management	Excel spreadsheets.	Web-based listing.
GIS	Limited use. Typically by other COMPONENT departments (e.g. public works/facilities).	Web-based map server will be made available.

Section 5. ESIS Implementation Alternatives Analysis

Four alternatives for ESIS implementation where considered as part of this BCA. This section lists the alternatives and provides an analysis that led to the selection of Alternative Number 4.

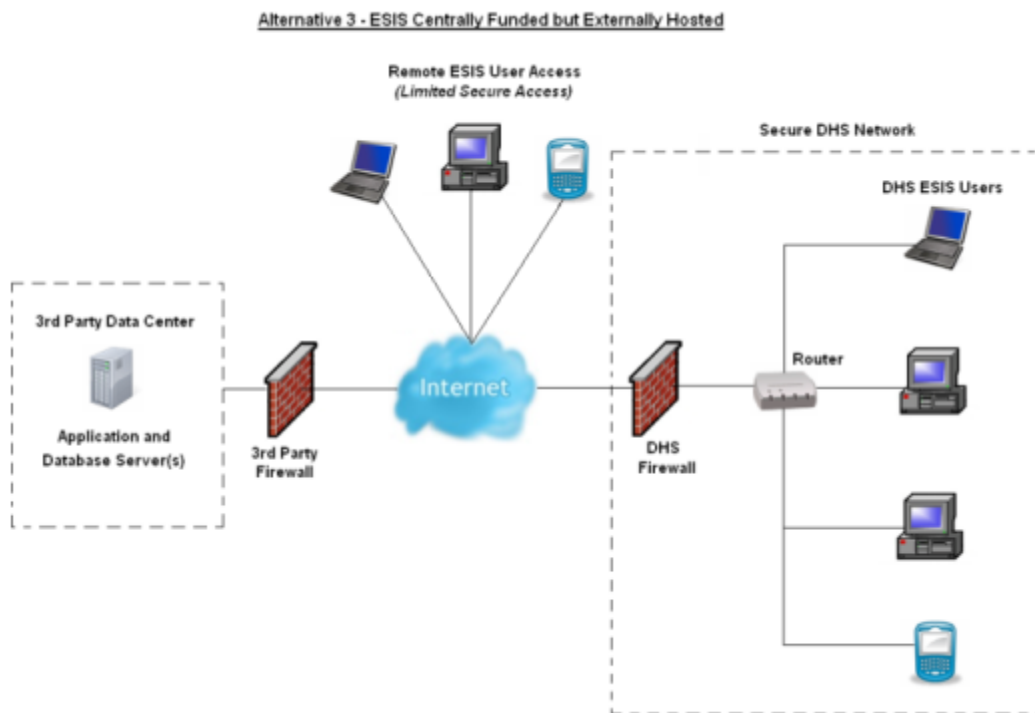
5.1 ESIS List of Alternatives

This BCA evaluated the following ESIS implementation alternatives:

1. Current system maintained (baseline alternative) using a mix of desktop software, paper-based systems and some web-based tools hosted internally and externally.
2. ESIS implemented, but not centrally funded, and hosted externally.
3. ESIS implemented and centrally funded, but hosted outside DHS.
4. ESIS implemented and centrally funded, and hosted inside DHS.

The schematic below shows the information technology setup for Alternative Number 3, where the ESIS is centrally funded but externally hosted with an Application Service Provider (third party host).

Schematic 1 – Alternative 3 - Information Technology Setup



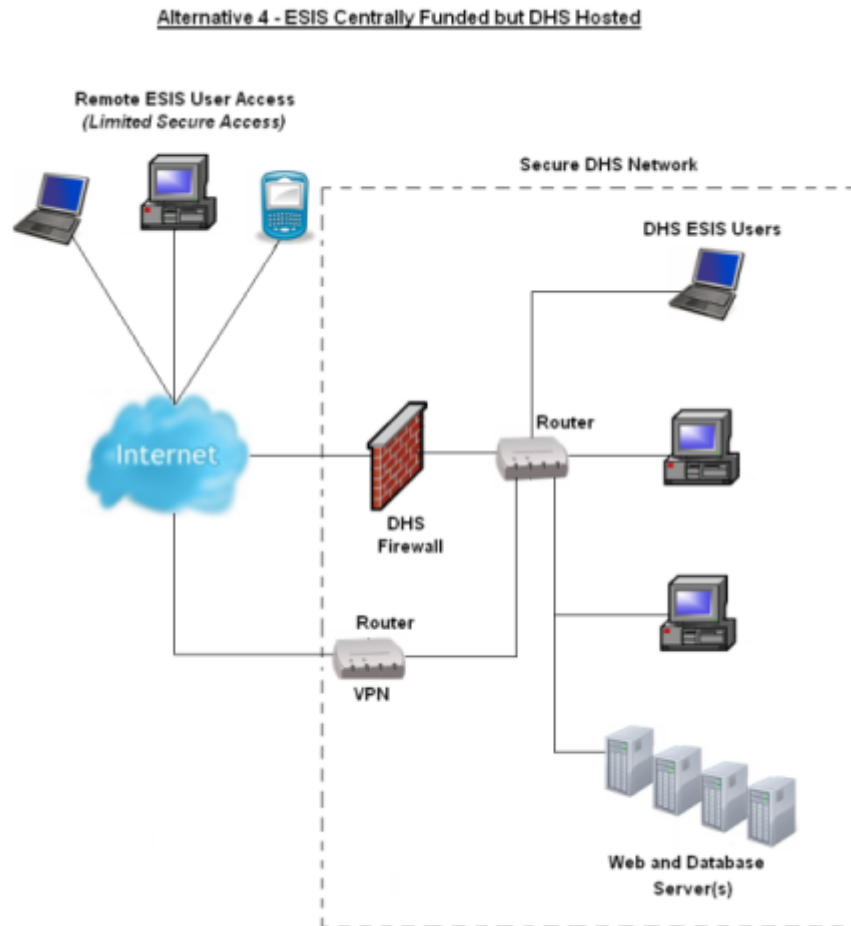
5.2 ESIS Alternatives Evaluation and Weighting Criteria

The following evaluation criteria were used to determine the best alternative:

1. **Cost** – The cost to deploy and maintain the alternative. Desktop systems may be significantly cheaper than an Enterprise system, but there are factors which diminish the utility of desktop software compared with web-based tools. Desktop software also includes a number of hidden costs (software licenses, time to maintain the systems, etc.). Web-based systems usually cost more to implement but over the long term realize significant benefits in reduced maintenance.
2. **Security Risk** – Security vulnerabilities or security risk associated with the alternative. A good enterprise system hosted on an external commercial server could present a high risk. An enterprise system located within the DHS network provides the highest level of security. The design of the ESIS would also include various security features, such as, passwords, roles-based security, and data encryption.
3. **Capability** – The value-added capabilities that would be provided by the alternative was also reviewed. An ESIS with tools focused on a number of specific regulatory requirements would be more effective than several systems that are not integrated. This

BCA offers an ESIS with sixteen integrated tools with powerful capabilities that can be used by most of the COMPONENTS.

Schematic 2 – Alternative 4 - Information Technology Setup



5.3 Analytical Scoring Approach

In scoring the three criteria, a weighted scoring system was used. Since the proposed ESIS stands to provide significant improvements in capability (i.e., up to sixteen compliance-focused tools for use by COMPONENTS) the capability criterion was weighted with an additional 50 percent.

5.4 Scoring Methodology

The scoring system methodology was a straightforward addition of fractions. The total scores also included a multiplication of the Capability Criterion which was weighted 50 percent greater than the Cost and Security Risk criteria.

Table 4 shows a summary of the calculations and scores for each alternative.

Table 4 – Analysis of ESIS Implementation Alternatives

Eval. Criteria:	COST	SECURITY RISK	CAPABILITIES	TOTALS	RISK SCORE
Score Key	High=1/Low=5	High=1/Low=5	High=5/Low=1		
Weighting Factor	1	1	1.5		
ALTERNATIVE	Score/Max	Score/Max	Score/Max		
1 – Status Quo (Baseline)	5/5	1/5	1/5	7.5/17.5	43
2 – ESIS Not Centrally Funded, DHS Hosted	3/5	3/5	3/5	10.5/17.5	60
3 – ESIS Centrally Funded, Externally Hosted	1/5	1/5	5/5	9.5/17.5	54
4 – ESIS Centrally Funded, DHS Hosted	1/5	5/5	5/5	13.5/17.5	77
5 – IDEAL System	5/5	5/5	5/5	17.5/17.5	100

Using the analysis above, a hypothetical ideal system (Alternative 5) would rank a 5/5 in all categories, indicating that the alternative would provide the following characteristics:

- Low cost
- High security
- Provide extensive sustainability and compliance-support software modules.

Since there is no ideal system with these characteristics **Alternative 4 was selected as the recommended alternative.**

Section 6. BCA Decision Analysis

The BCA Decision Analysis section highlights the advantages and disadvantages associated with each of the alternatives and shares some of the analysis provided in Section 5.

6.1 Alternative 1: Status Quo (Baseline)

Under this approach, no ESIS would be implemented and the current systems used by the COMPONENTS would be maintained. Key areas of consideration for this alternative include:

- Desktop applications and paper-based, manual approaches would continue to be used. There would be cases where web-based applications would be used to manage specific media.
- There are significant tangible and hidden costs associated with this alternative. The single-media-focused web-applications, like the DHS NEPA software, could cost in excess of \$300,000 to implement. Paying a contractor to implement a Microsoft SharePoint system to be used across the COMPONENT could cost over \$150,000.
- This BCA estimates that approximately \$800,000 is spent annually on software expenditures maintaining the current systems/approaches in use by the COMPONENTS and DHS-HQ to manage environmental compliance and sustainability. The BCA escalates the cost of these estimates by about 2–to-5 percent per year to reach an 8-year life cycle cost which makes maintaining the status quo costly over the long term.
- Utilizing this approach may include stronger security than alternatives 2 and 3 below because environmental work products are not stored externally, however, the potentially scattered nature of documents and data on different computers could lead to security vulnerabilities.
- The tools used as part of the status quo offer a variety of capability. One of the short comings with maintaining different spreadsheets could be consistency in data managed. Another short coming could be the duplication of effort among the COMPONENTS.

6.2 Alternative 2: ESIS Not Centrally Funded and Externally Hosted

Under this alternative, an ESIS would be implemented, but would not be centrally funded. This alternative assumes that the ESIS would be selected and purchased by each COMPONENT with their own funds. Key areas of consideration for this alternative include:

- This is the model used by the United States Air Force for its Enterprise Environmental Safety and Occupational Management Information System (EESOH-MIS), where the major Air Force commands are billed on a percentage basis for the overall cost of the software solution.
- One disadvantage with this alternative is that COMPONENTS who do not approve of the software would be reluctant to share in the costs of the software. There would also be major issues associated with standardization or the establishment of priorities involving what to track and manage that would make the overall performance of the system difficult and expensive.
- Another disadvantage could be resource constraints from one COMPONENT to the next. As an example, some COMPONENTS do not have dedicated environmental departments (e.g., CIS) and no dedicated environmental funding. This could pose a significant problem with trying to get initial funding and also in assuring continuity funding.
- In letting COMPONENTS fund their own ESISs, there could also be the problem with each COMPONENT purchasing a different system with different capability strengths and weaknesses.

6.3 Alternative 3: ESIS Centrally Funded and Externally Hosted

Under this alternative the ESIS would be centrally funded by DHS, but hosted on a non-DHS server (commercially) at a reputable data center (like Rack Space). This approach is becoming increasingly common in the private sector and is called “Cloud Computing” or “Application Service Provider (ASP) Computing.” Key areas of consideration for this alternative include:

- In general, Cloud/ASP computing customers do not own the physical infrastructure where their data and documents are stored. A major advantage of this approach is that the ultimate users of the software do not have major IT-related capital expenditures.
- Organizations using software hosted by ASPs typically consume resources as-a-service and pay only for resources that they use. The ASP, not the end-user firm, has the responsibility to maintain the software and keep it available 24-hours per day, 7-days-per-

week. The ASP is also required to provide technical support, physical and electronic security, and in-built support for business continuity in case a server goes down.

- The primary disadvantage of an ASP module would be the potential for significant security vulnerabilities presented by hosting DHS COMPONENT work-products on a server outside of DHS.

6.4 Alternative 4: ESIS Centrally Funded and Internally Hosted

Under this alternative, the ESIS would be funded centrally and hosted on a DHS Server inside the DHS network. Users would access the software by logging into the ESIS with credentials similar to what they use to log into the DHS network on a day-to-day basis.

DHS would procure or develop a software application that forms the basis for the ESIS, and host it inside DHS network. Key areas of consideration for this alternative include:

- **Cost** – The web-based ESIS may cost more to implement initially, but over the life-cycle span of the software's anticipated use will cost less than Alternatives 1, 2 and 3.
- **Security Risk** – An enterprise system located within the DHS network provides the highest level of security for DHS's environmental compliance and sustainability work products. The design of the ESIS would also include various security features, such as, passwords, roles-based security, and data encryption.
- **Capability** – The ESIS would include sixteen tools focused on several specific regulatory requirements that would be more effective than several desktop software tools that are currently in use or web-based systems that are not integrated across the Department. This BCA offers an ESIS with sixteen integrated and customized tools with powerful capabilities that can be used by most of the COMPONENTS.

6.5 Analysis of Alternatives: Conclusion

This BCA recommends **Alternative 4: ESIS Centrally Funded and Hosted on a DHS Server**.

Section 7. ESIS Benefit-Cost Analysis

7.1 ESIS Benefit-Cost Analysis Approach

A Benefit-Cost analysis is used in a BCA to determine the best value solution for a project. The Benefit-Cost Analysis assesses each alternative and weighs total cost against total benefits to arrive at the optimum solution. This analysis process also documents how each alternative fulfills strategic organization objectives, and assesses the potential impact on stakeholders and end-users.

The decision to invest in any major IT initiative is made based on how well the solution meets the needs of the organization. For profit-focused organizations (commercial enterprises), this decision is usually based on the return on investment (ROI) to the organization offered by the solution and how quickly it is returned. For non-profit organizations, the decision is often made by assessing how much money is saved by implementing a solution. In a government organization, the benefit-cost analysis goals may fit in between those of the profit and non-profit organizations. Regardless, the sponsors of the BCA or those providing the funding for the ESIS would need to have a clear understanding of the overall benefits associated with the prospective initiative.

A traditional Benefit-Cost Analysis includes the calculation of a Net Present Value (NPV) to assess the potential profitability of an investment. NPV represents the difference between the total investment (costs) over its planned life cycle and the present-day value of the anticipated future annual cash flows (benefits). For this BCA, NPV is not calculated because of the difficulty in determining the future annual cash flows that would result from this investment since physical products are not being sold. An attempt, however, could be made to look at the costs of compliance, such as, fines and other factors that cannot be easily monetized (e.g., time to manage compliance with a predominantly paper based system versus an automated system), and apply them to the analysis.

Section 2 provides a comprehensive list of potential tangible and intangible benefits to be derived from the implementation of an ESIS.

A benefit-cost matrix is provided in Table 5 which highlights the advantages and disadvantages of each BCA implementation alternatives together with associated risk.

Table 5 – ESIS Implementation Alternatives – Advantages and Disadvantages

OPTION	ADVANTAGES	DISADVANTAGES
1: Maintain Status Quo	<ul style="list-style-type: none"> • Low-to-Medium Total Cost of Ownership 	<ul style="list-style-type: none"> • Numerous desktop applications • High inefficiencies from doing the same work or tasks many times over • Limited sharing of best practices • Uncertain compliance assurance
2: ESIS Not Centrally Funded and Hosted Externally	<ul style="list-style-type: none"> • Web-based • One central application • Limited hardware/software costs • Enhanced Compliance Assurance 	<ul style="list-style-type: none"> • COMPONENTS need to find funding • Future funding uncertainty if a particular COMPONENT is using the software less or more vs. others • If hosted externally, there would be significant security vulnerabilities
3: ESIS Centrally Funded and Hosted Externally	<ul style="list-style-type: none"> • Web-based • One central application • Pleased COMPONENTS (ESIS funded by DHS) • Reduced Total Cost of Ownership • Enhanced Compliance Assurance 	<ul style="list-style-type: none"> • Major security risks if hosted externally.
4: ESIS Centrally Funded and DHS Hosted	<ul style="list-style-type: none"> • Web-based • One central application • Pleased COMPONENTS (ESIS funded by DHS) • High security • Enhanced Compliance Assurance 	<ul style="list-style-type: none"> • Long term costs associated with hardware and software maintenance

7.2 Status Quo Pricing for the Current State

Status Quo Pricing is determined by adding the cost of maintaining the current desktop software applications used inside DHS by various COMPONENTS, and the current web-based applications used to support specific compliance functions (e.g., CP-Track). Desktop tools include the NEPA application used by DHS HQ and EnviroManager Software used by the USCG. Software application costs usually include an estimate of license fees, server maintenance and backups. The BCA conservatively estimates this cost to be about \$800,000 per year.

The status quo costs would also include the cost of compliance-related fines that could have been mitigated by the use of a working ESIS. For example, the operation of a robust compliance-focused Hazardous Waste module could have prevented a large fine incurred by one of the COMPONENTS. Since this type of cost saving is difficult to quantify, it is not incorporated into this analysis.

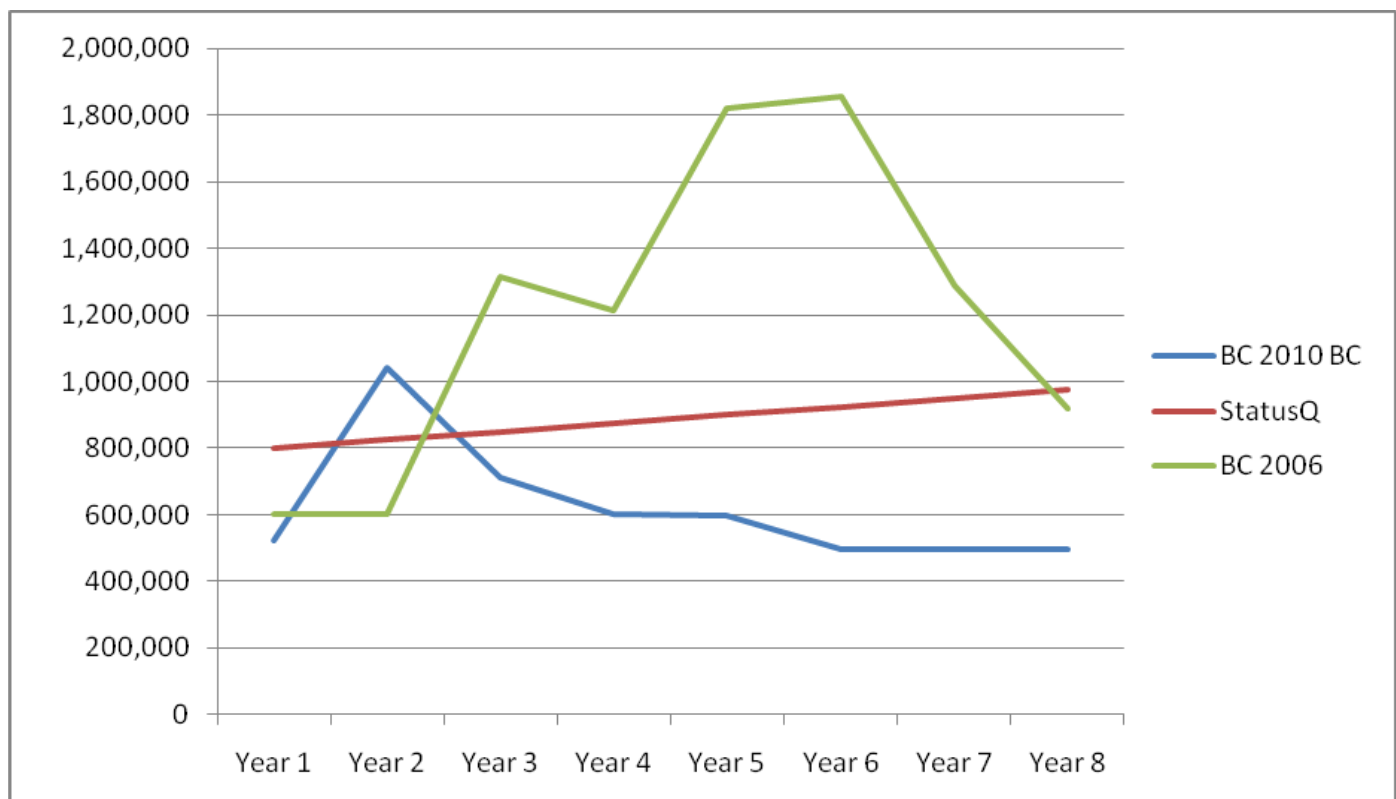
7.3 Life Cycle Pricing for the Selected Alternative Number 4

A summary of Estimated Annualized Costs is provided in Table 6 (and plotted in the figure below) using three approaches:

- BCA 2010 – Cost to implement the tools outlined in this BCA using Alternative 4 (ESIS Centrally Funded and Hosted by DHS).
- Status Quo – Cost to utilize various software tools in place across DHS today (See Section 6.1).
- BCA 2006 – Cost to implement an ESIS using the Study carried out in 2006 (an escalating inflation factor has not been applied to these numbers).

Table 6 – Comparison Summary of ESIS Life Cycle Implementation Costs

Approach	Year 1	Year 2	Year 3	Year 4	Year 5	Year6	Year 7	Year 8	Total
BCA 2010	520,604	1,042,872	713,672	600,042	595,912	494,712	494,712	494,712	4,957,248
Status Quo	800,000	825,000	850,000	875,000	900,000	925,000	950,000	975,000	7,100,000
BCA 2006	600,000	600,000	1,315,370	1,212,870	1,820,870	1,857,870	1,286,245	920,370	9,613,595



Total Cost of Ownership (TCO) analysis aims to quantify the costs (money, time and resources) of owning and using a software application over its expected lifetime.

The costs presented in this BCA and summarized in the yellow row on table 6 are based on an expected 8-year life cycle of the ESIS. The costs for the ESIS include more than the cost of software licenses and maintenance. Since there would be a specific amount of customization, overall costs will include:

- Implementation costs
- Ongoing IT support
- Training
- Help Desk

A detailed breakout of costs for Alternative 4 is included in Appendix 3 of this BCA.

Section 8. ESIS Implementation Challenges and Risks

An important part of a BCA preparation is the acknowledgement of risks. The federal government recognizes risk management as a key component of good project management and an important consideration when developing BCAs.

A risk assessment is necessary to ensure that potential situations that could adversely impact the successful implementation of the management system have been identified. Risk management is the systematic approach to developing a plan to mitigate the risks identified through the process of risk identification, assessment, comprehension, monitoring, and evaluation.

Table 7 presents the Cultural, Technological and Financial risks that could affect the implementation of the ESIS, and the potential mitigation strategies. Risks in the case of this BCA are defined as anything that could block or interfere with the successful implementation of the ESIS initiative.

Many of these risks listed in the tables below were discussed in the 2006 Recommendation Report.

8.1 Cultural Challenges and Risks

CULTURAL Challenges and Risks	Possible Mitigation
<ul style="list-style-type: none"> • Lack of end user acceptance • Resistance to migration to new system • limited user input to the system 	<ul style="list-style-type: none"> • Communication of ESIS benefits • Creation of policy document to guide mandated and/or optional use of tools • DHS-HQ to garner top management support and establish Functional User Group with membership from COMPONENTS
<ul style="list-style-type: none"> • Difficulty with integrating existing tools 	<ul style="list-style-type: none"> • Provide a simple road map to import required work products
<ul style="list-style-type: none"> • Overly complicated system that is not user friendly for end-users 	<ul style="list-style-type: none"> • For end-users, design simple user interfaces. • Include common functionality mirrored across applications. • Incorporate different role levels into the design so that users see only what they need to see to manage compliance and sustainability • Provide training to foster adoption. • Provide well-written user manuals

CULTURAL Challenges and Risks	Possible Mitigation
<ul style="list-style-type: none"> Environmental Managers too busy. Some have Safety and Occupational Health responsibilities 	<ul style="list-style-type: none"> Software should help make the work environment more efficient.
<ul style="list-style-type: none"> Variety of environmental management maturity levels 	<ul style="list-style-type: none"> Conduct Gap Analysis before deployment and customize deployment activities based on needs. Some COMPONENTS may require more support than others.
<ul style="list-style-type: none"> Protracted deployment timeline 	<ul style="list-style-type: none"> Conduct rapid deployments, instead of drawn out multi-year deployments
<ul style="list-style-type: none"> Lack of ongoing support resources 	<ul style="list-style-type: none"> Provide a help desk and maintain the use of the Functional User Groups

8.2 Financial Challenges and Risks

FINANCIAL Challenges and Risks	Possible Mitigation
<ul style="list-style-type: none"> Schedule delays, cost overruns and delayed implementation 	<ul style="list-style-type: none"> Sound planning and the use of a contractor with a proven track record to execute this type of large deployment
<ul style="list-style-type: none"> Long procurement cycle for financial (funding) approval 	<ul style="list-style-type: none"> Work with procurement department and contracts to assist with the Office of Management and Budget (OMB) Exhibit 300 BCA process (if needed)

8.3 Technological Challenges and Risks

TECHNOLOGICAL Challenges and Risks	Possible Mitigation
<ul style="list-style-type: none"> DHS Enterprise architecture issues 	<ul style="list-style-type: none"> Work through them early with the DHS IT department
<ul style="list-style-type: none"> IT restrictions 	<ul style="list-style-type: none"> Involve IT in the design and deployment phases of the ESIS
<ul style="list-style-type: none"> Migrating Legacy Data 	<ul style="list-style-type: none"> Identify legacy needs ahead of deployment through a module Gap Analysis checklist to determine what is available and what needs to be imported
<ul style="list-style-type: none"> Network Limitations. The efficiency of web-based applications depends on the ability of the existing network and server to carry the access loads. 	<ul style="list-style-type: none"> Work with IT to ensure network availability (uptime) and access times.
<ul style="list-style-type: none"> DHS IT not familiar with code 	<ul style="list-style-type: none"> Provide clear documentation of software code and requirements
<ul style="list-style-type: none"> Software scope creep that could bog down the effectiveness of the ESIS. 	<ul style="list-style-type: none"> DHS (management and Functional User Group) must set priorities and stick to them.

Section 9. Conceptual ESIS Operations

9.1 Concept of Operations (CONOPS)

The following section provides an overview of how the ESIS would work within DHS and its COMPONENTS.

9.1.1 Operational Process Overview

The software modules provided by the ESIS would be offered as either mandatory or optionally used tools.

9.1.2 Logistical Process Overview

- Implementation logistics could be a challenge if there is poor deployment planning. The constraint will be mitigated with a detailed Implementation Plan.
- Implementation logistics could be a challenge if the implementation team is not experienced. A typical rollout would involve a group of primary users from a COMPONENT training together at a central location (could be regional if the COMPONENT is large).
- It is anticipated that a certain amount of data and documentation would be pre-loaded into the system.
- Operational logistics should not play a major role in the ESIS implementation since the software is web-based (although set up within the DHS network). The deployment support contractor, for example, would not need to load several hundred pieces of desktop software files various desktops across the COMPONENTS.

9.2 Impacts Associated with DHS Information Technology Standards

This section describes the policies and standards that could impact the implementation of the ESIS.

A senior DHS manager would clarify which policies and standards might be applicable to this type of investment. The IT considerations are included in Table 9.

Table 8 – IT-Related Policy and Standards Considerations

Policy/Standard Area	Description
Security	Considerations in this area include: <ol style="list-style-type: none"> 1. Physical security of hardware 2. Physical safety of information (data and documents) 3. Restrictions and authorizations of access to information contained in the ESIS 4. Authentication and validation of users 5. Protection from hacker attacks 6. Regular backup operations 7. Compliance with DHS Information Security requirements
Privacy	Considerations in this area include: <ol style="list-style-type: none"> 1. Privacy safeguards 2. Prevention of the release of classified information 3. Freedom of Information Requests
Accessibility	Considerations in this area include: <ol style="list-style-type: none"> 1. Software access to individuals with disabilities 2. Software access to users without a high speed network connections
Information Management	Considerations in this area include: <ol style="list-style-type: none"> 1. DHS policies and directives on Information Management 2. Any applicable standards listed as mandatory requirements under these policy instruments
Enterprise Architecture	Considerations in this area include: <ol style="list-style-type: none"> 1. How does the planned ESIS support enterprise architecture standards 2. Integration with established business practices and DHS systems 3. Reuse of common application COMPONENTS already in use

9.3 ESIS Security Considerations

Security requirements for the proposed ESIS are critical because of the type of work DHS does.

In looking at security-related considerations, the proposed implementation of Alternative 4 (ESIS Centrally Funded and Hosted within the DHS network) provides the highest levels of security of the four options considered. The security advantages of the selected Alternative are:

- The application would be shielded from viruses, denial of service attacks, hacking and data intrusions because it is hosted within the DHS firewall.

- With the single sign-on (login), access to the software would be controlled and provided only to DHS-authorized users. The single sign-on would also facilitate software adoption by not having the user memorize another username and password to access the system.
- Although the application is 'web-based,' it would not be accessible over the Internet. Rather, internet-based technologies would be employed to access and use the application (i.e., users would use a common browser to access the software) within an Intranet setting.
- Security would also be maintained at the COMPONENT level and also by role-based access to specific sections of the software.
- The implemented ESIS would be developed in compliance with the Federal Information Security Management Act (FISMA) and DHS Certification and Accreditation (C&A) requirements.

Section 10. ESIS Implementation Next Steps

While the BCA provides a justification for the establishment of the ESIS, the Implementation Plan will provide a roadmap for the successful deployment of the ESIS Alternative 4.

Table 9 highlights the next steps in the ESIS implementation process.

Table 9 – Major ESIS Implementation Milestones

Milestones/Deliverables	Months	Time Frame
1. BCA Analysis	9	October 2009 – June 2010
2. Implementation Plan	7	January 2010 to July 2010
3. Acquisition Funding and IT Approvals	6	April 2010 to September 2010
4. Requirements Analysis and Design	2	August 2010 - September 2010
5. Programming Build/Customize	4	October 2010 to January 2011
6. Fielding – Pilot Trials/Bug Fixes	3	January 2011 – March 2011
7. Fielding - Full Deployment	12	April 2011 – March 2012
8. Ongoing Support and Maintenance	12+	April 2012 +

Appendix 1 – Glossary

Term	Description
AST	Above Ground Storage Tank
ASP	Application Service Provider
AUL	Authorized User List
BMP	Best Management Practice
COTS	Commercial off-the-shelf
CWA	Clean Water Act
DBA	Database Administrator
DHS	Department of Homeland Security
DHS COMPONENT	DHS organization. (e.g., USCG, CBP, FEMA, US-VISIT, TSA)
DMR	Discharge Monitoring Report
GOTS	Government off-the-shelf
EMS	Environmental Management System
EPA	Environmental Protection Agency
EPAS	Environmental Performance Assessment System
EPCRA	Emergency Planning and Community Right to Know
ESIS	Environmental Sustainability Information System
FLETC	Federal Law Enforcement Training Center
GIS	Geographic Information System
HTTP	Hyper Text Transfer Protocol
ICRMP	Integrated Cultural Resource Management Plan
ISO14001	International Organization of Standardization
KPI	Key Performance Indicator
MOTS	Modifiable off-the-shelf
MSDS	Material Safety Data System
NEPA	National Environmental Policy Act
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
NPV	Net Present Value
O&M	Operations and Maintenance
ODS	Ozone Depleting Substance
OMB	Office of Management and Budget
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated Biphenyls
PSD	Prevention of Significant Deterioration
RCRA	Resource Conservation and Recovery Act
REJ	Rapid Economic Justification

ROI	Return on Investment
SOP	Standard Operating Procedure
S&T	Science and Technology
SaaS	Software-As-A-Service
SHPO	State Historical Preservation Office
SPCC	Spill Pollution Countermeasures and Control
SIP	State Implementation Plans (Part of Clean Air Act Compliance)
SME	Subject Matter Experts
SPDES	State Pollution Discharge Elimination System
TCO	Total Cost of Ownership
TRI	Toxic Release Inventory
TSA	Transportation Security Administration
TSCA	Toxic Substances Control Act
TSD	Treatment, Storage and Disposal
UEG	Unit Environmental Guide
US-VISIT	United States Visitor and Immigrant Status Indicator Technology
UST	Underground Storage Tank
US-SS	United States Secret Service

Appendix 2 – Environmental Systems Reviewed

User	Tool	Description
Air Force	EESOH-MIS	Enterprise Environmental Safety and Occupational Health Management Information System is an Air Force developed and managed software program to manage ESOH requirements.
Army	EPAS	Environmental Performance Assessment System (EPAS) is an Army developed managed program designed primarily to help Garrison Commanders achieve, maintain, and monitor environmental and management performance at their installations.
DHS-HQ	NEPA Portal	Used to manage the NEPA process
DHS – TSA	EMS Web Portal	Paperless document repository. Compliance audit resolution management
US-SS	Fed Center	A compliance assistance resource repository used by federal organizations to manage compliance and other requirements.
Marines	EMS Portal	Microsoft SharePoint-based software developed and managed by the United States Marines Corps to manage environmental compliance
NASA	HMMS	Privately owned software used to manage Hazardous Materials and Hazardous Waste. HMMS is also used by other DoD services.
NASA	NEPS and SharePoint	National Aeronautic and Space Administration tool for managing key environmental documents and EMS
Navy	EMS Web	Developed and managed by the U.S. Navy as a document management system for hosting ISO 14001 EMS documents. Also used by the Navy to manage environmental funding requests.
Navy	ECATTS	Privately owned software used primarily by the Navy to manage environmental compliance training.
Postal Service	ESHMS	Environmental Safety and Health Management System used to manage ESOH for the Postal Service
USACE	CP-Track	Initially funded by the USACE this application is used by various federal services, including DHS to manage audits. It includes a dynamic List Builder and features to record and resolve compliance findings.
USCG	Compliance Guides	USCG funded application used to list documented compliance guides in an easily accessible web-based format (used by USCG Stations on the West coast and Pacific areas)
USCG	EnviroManager	Used to manage EMS, hazardous materials, hazardous waste, asbestos, tanks, environmental compliance evaluations (ECEs), and compliance training. Some modules have been funded and customized by the USCG. EnviroManager is also used by various Navy, Army and Air Force organizations.

Appendix 3 – Estimated Annualized Life Cycle Costs

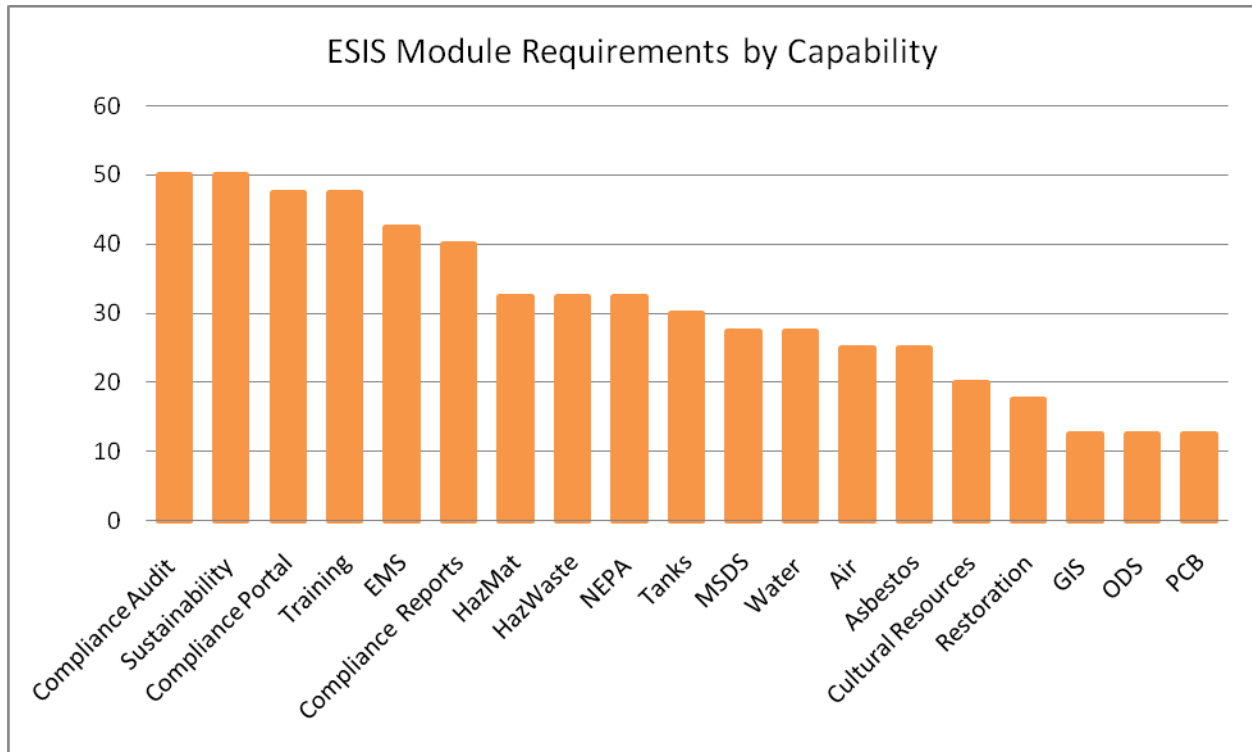
Approach	Year 1	Year 2	Year 3	Year 4	Year 5	Year6	Year 7	Year 8	Total
BCA 2010	520,604	1,042,872	713,672	600,042	595,912	494,712	494,712	494,712	4,957,248
Status Quo	800,000	825,000	850,000	875,000	900,000	925,000	950,000	975,000	7,100,000
BCA 2006	600,000	600,000	1,315,370	1,212,870	1,820,870	1,857,870	1,286,245	920,370	9,613,595

Details of the Estimated Annualized Costs highlighted above are derived from the table below.

ESTIMATED ANNUALIZED ESIS COSTS (2010 BCA Analysis)											
	Months	Software Manager + Quality Assurance	Business Analyst+ Compliance Manager	Junior Support+ Help Desk	Oracle DBA + Systems Admin	Deployment Trainers	Admin	Total	Travel	ODCs	Total
Design	1	20,010	16,530	0	19,140	0	600	56,280	10,000	8,442	74,723
Build	4	59,800	24,700	13,050	57,200	0	2,400	157,154	40,000	20,573	220,727
Test/Pilots	3	20,010	49,400	39,000	57,200	16,530	600	182,743	15,000	27,411	225,154
Deploy/All	12	119,600	148,200	153,000	200,200	148,200	7,200	776,412	150,000	116,460	1,042,872
Support Year 1	12	59,800	98,800	153,000	200,200	49,400	7,200	568,412	60,000	85,260	713,672
Support Year 2	12	59,800	49,400	153,000	200,200	0	7,200	469,612	60,000	70,440	600,052
Support Year 3	12	59,800	49,400	153,000	200,200	0	3,600	466,012	60,000	69,900	595,912
Support Year 4	12	59,800	49,400	153,000	112,200	0	3,600	378,012	60,000	56,700	494,712
Support Year 5	12	59,800	49,400	153,000	112,200	0	3,600	378,012	60,000	56,700	494,712
Support Year 6	12	59,800	49,400	153,000	112,200	0	3,600	378,012	60,000	56,700	494,712

\$4,957,248

Appendix 4 – ESIS Requirements by Capability



Notes:

Results from the COMPONENT interviews were put into a matrix presenting the potential level of need for each software capability. The information was then numerically summarized with need for each capability ranked from highest to lowest priority.

Instead of using a complicated Needs Assessment protocol, this BCA utilized grading levels to prioritize needs from “Mid-to-High-Need” to “No-to-Low Need”. The rationale behind the broad options used was the recognition that needs change. For example, some software capability needs do not currently exist but may be required in the near future. Furthermore, a COMPONENT may currently have a high need for a specific capability (e.g., to manage NEPA actions at a large property) that will be lessened significantly in the future (following the sale of the property).

Appendix 5 – Compliance Assurance Matrix

Environmental Protection Agency (EPA) Interdepartment Chart

