

Appendix E

Sample Functional Requirements Document For Web Sites Including Information About Brownfields Properties

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1.0 INTRODUCTION

This functional requirements document describes sample procedures that potentially could assist individuals who are planning, designing, and operating web sites that include information about individual brownfields properties. With proper design and operation, web sites have the potential to enhance the exchange of information between sellers and buyers of brownfields properties at the local, state, regional, and national levels. The sample procedures are based on a web site design that the U.S. Environmental Protection Agency (EPA) developed as an optional design for consideration by those individuals who currently are planning, designing or operating web sites that list brownfields properties. The optional design is available at <http://clu-in.org/bfwebsite>. The purpose of this functional requirements document is to provide a general framework for a more detailed set of procedures typically required to operate web sites. The extent to which a more detailed set of procedures will be required for each web site is dependant upon the complexity and operating parameters of that web site.

1.1 BACKGROUND

In conjunction with its study to assess the feasibility of establishing a national brownfields site exchange web site, EPA met with potential buyers and sellers of brownfields properties, as well as other national and local stakeholders, to solicit their ideas and suggestions about how to operate such a web site in order to best serve their needs. In general, many property owners appear to be willing to provide information about their properties, but lack the resources required to collect and assemble comprehensive information and update it routinely. On the other hand, prospective buyers of brownfields properties desire as much information as possible to enhance their ability to screen properties and identify the properties that best meet the buyers' criteria. On the basis of its discussion with brownfields stakeholders, observations of information that is currently collected about brownfields properties, and information that is available to the general public about listings of brownfields properties, EPA is providing a suggested minimum set of information items that should be present for a property in order to include that property in a web site that lists brownfields properties for sale. Web site operators may have to strike a balance in defining minimum information items for their systems.

1.2 OBJECTIVES FOR WEB SITES THAT INCLUDE BROWNFIELDS PROPERTIES

Recognizing the broad range of interests of potential users of web sites including brownfields information, current initiatives underway to assemble information about brownfields properties and the

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potential large volume of information to be managed about properties, the following objectives should be considered in the design of web sites that include information about brownfields properties:

1. The web sites should allow the public easy access to information about the properties listed.
2. The web sites should integrate data that already have been collected about the properties listed.
3. The web sites should provide direct links to other sources of information, including independent databases.
4. The web sites should be designed to minimize the amount of time required for the management and updating of data and operation of the system.

2.0 OVERVIEW OF WEB SITE OPERATING SYSTEMS

The primary function of a web site should be to allow users to easily search a database of brownfields properties. The secondary function of a web site should be to allow users to add or update the records in the database. This is an important function for brownfields properties because; (1) the Brownfields Program continues to grow and new properties are constantly being added to the program, (2) properties need to be removed from the data base because they are sold or for other reasons, (3) new information to characterize contamination is being obtained as properties move through the site assessment process, and (4) property owners continue to receive new incentives to redevelop their properties and information about these incentives should be communicated to potential purchasers. Other functions that potentially could increase the utility of a web site are:

- Automatic e-mail notification of registered users when new properties are added to the database
- Monitoring the use of the system for administrative purposes
- Automatic warning to data providers by e-mail when property listings expire or when status updates are needed
- Automatic expiration of outdated property listings

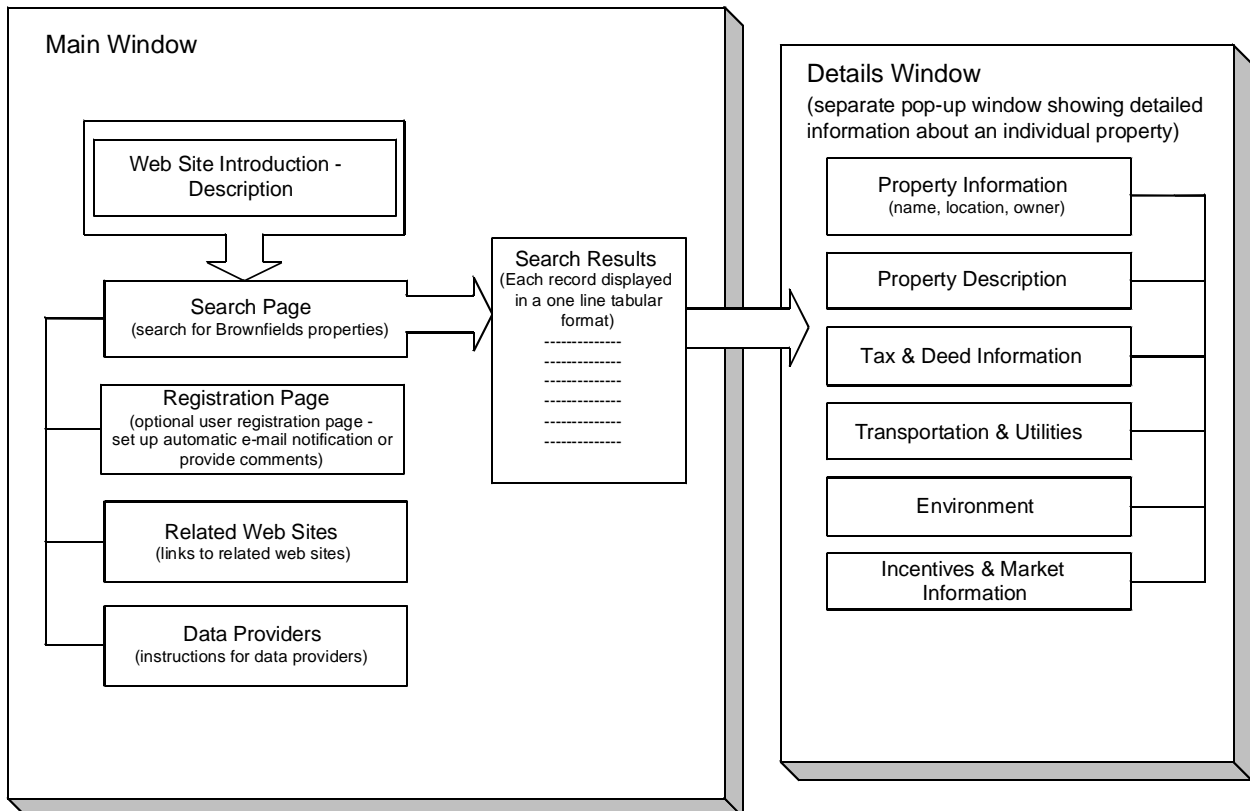
2.1 SYSTEM PLATFORM AND INTERFACE

A web site of brownfields properties should be accessible to anyone who can log onto the World Wide Web using a standard browser that is version 4.0 or higher. The inventory of brownfields properties should be maintained in a relational database, such as Oracle. A combination of standard HTML and a scripting language for web application, such as Cold Fusion or MS Server Pages, should be considered in developing the web page interfaces.

2.2 WEB SITE LAYOUT AND DESIGN

The following diagram shows the relationships between the pages that are included in the optional web site design EPA prepared.

Figure 1. Web Site Diagram



2.3 HOME PAGE

The home page is the first page that users see. The home page captures the attention of users, including potential buyers and sellers of brownfields properties, cleanup contractors, and other service providers. To provide visual continuity between all pages, a banner graphic should appear at the top of each page, and load quickly. The remaining space on the home page screen could be filled with introductory text and hypertext links to other parts of the web site. The home page may include success stories and discussions of recent sales of brownfields properties. The page may show statistics, such as the total number of properties currently in the database and the number of new properties added during the past month.

The home page from EPA's optional design has several hypertext links, with the following purposes:

- The "find brownfields" button links to the main search page, where the user can build a query and find specific brownfields properties.
- The "related links" button takes the user to a list of related web sites. At a minimum, the list could include links to web sites that belong to organizations that will add property listings to the brownfields property web site.
- The "register" button links to a registration page. Registration can be optional. Registered users will have the advantage of receiving e-mail updates when new properties are added to the database or information about properties already listed is modified.
- The "data providers" button links to a web page where, after logging in, the user could add listings or update records they provided earlier.
- The "feedback" button provides an electronic mail connection to the Webmaster and allow users to send questions when they have trouble using the site.
- The "help" link can provide simple instructions for using the web page. This link should be available on all screens and include a list of frequently asked questions and answers. Additionally the link could provide basic definitions of terminology used throughout the site and information on creating an account, as well as basic contact information.

2.4 FIND PROPERTIES FUNCTION

The process of building a search should be simple and straightforward. The users should have the ability to select search criteria from pick lists. Search criteria include property location (city or county, state and Zip code), size of property, ownership, zoning, available development incentives, and status of

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environmental investigations. The search function should default to a logic, such as Boolean, requiring that search results match all the selected criteria (that is, criterion 1 AND criterion 2 AND criterion 3...). The only exception might occur when the user selects more than one incentive as criteria. The search function should find all sites that meet one or more of the incentives selected (that is, incentive 1 OR incentive 2...).

For the EPA optional design, when a user initiates a database search by clicking the Submit button (see Figure 2), the next web page display lists all properties that satisfy the user's criteria (see Figure 3). Properties are listed in a tabular format, with separate columns for such essential data elements as state,

Figure 2. Mockup of a Search Page

Brownfields Property Web Site

Brownfields Property Search

Search for brownfields properties by specifying the criteria below. Click the Submit button to start the search. If you wish to change a criterion you have selected, press the Reset button to start over again.

[Note: Since this web site is only a mock-up of an optional design, the form below is not functional. Clicking the "Submit" button below will bring up a list of mock search results.]

City: County:

State: Zip code:

Site Size: to acres

Ownership:

Investigation Status *:

Remediation Status *:

Zoning *

- Industrial
- Commercial
- Residential
- Retail
- Mixed Use
- Other

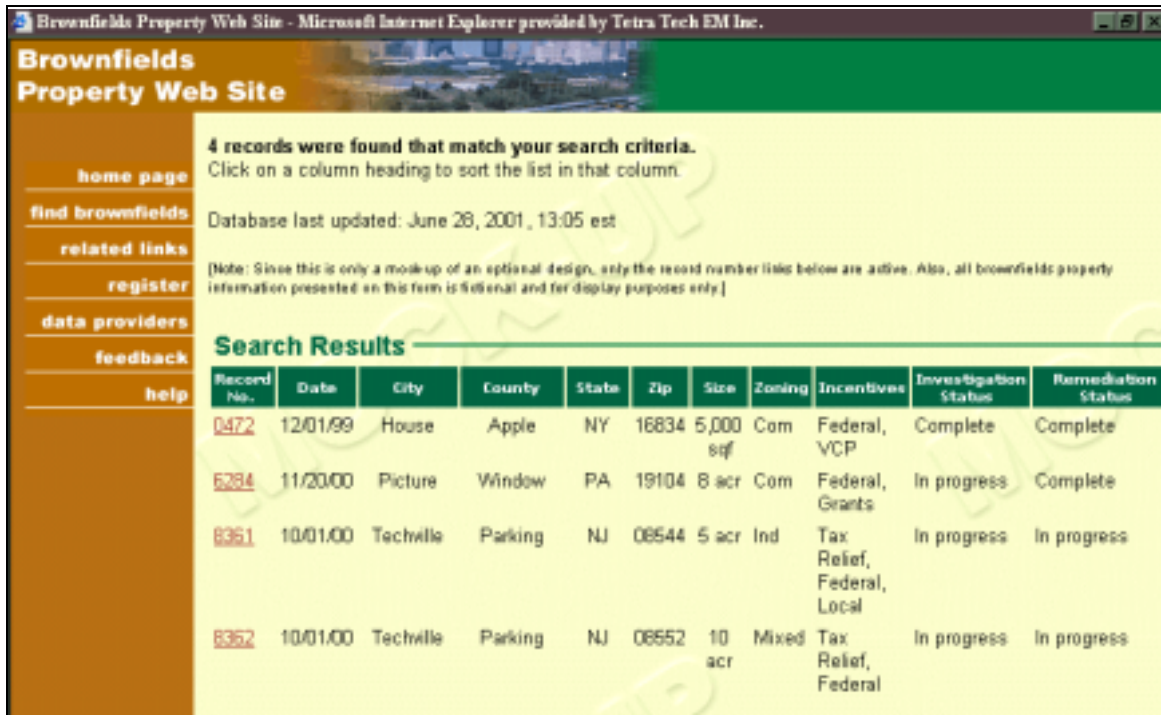
Incentives *

- Local
- State
- Federal
- Loans
- Tax Relief
- Grants
- Bonds
- Voluntary Cleanup Program
- Comfort Letter

* [Help](#)

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Figure 3. Mockup of a Summary Search Results Page



Zip code, county, acreage, environmental status, and development incentives. The default sort order of the tabular list is ascending, by city and then by Zip code for cities that have a number of Zip codes. The user can click on any column heading to sort the list by that column. To reduce loading time for each page, the list is displayed in increments of 30 records per page. Each property is assigned a unique record number to assist users in searching for information. The record numbers are assigned sequentially as new properties are listed.

The user can view detailed information about any of the brownfields properties shown in the summary list. When the user clicks on a property record number in the summary list, an overview of the property appears in a separate pop-up window (see Figure 4). To compare properties side by side, the user can open additional windows to facilitate side-by-side comparison of properties.

The overview of the property may include a direct link to another web site or another database that provides more detailed information about the property. Links to other sources of information can be accomplished through two programming methods. The simplest method is to provide a link to the home page of a data provider. In that case, it may be necessary that the user run another search to find the

Figure 4. Mockup of the Detailed Property Information Page

Location Property Tax Information History Transportation	Close															
Market Information Utilities Environment Remediation Photo																
Detailed Information for Property # 0472																
[Note: This page is a mock-up of an optional design. The information presented here is fictional and for display purposes only.]																
Location																
3501 Tilden Rd House NY, 16834																
Property																
Property Name: Area: 5,000 square feet Ownership: Public Available Incentives: Federal, VCP Contact Name: Joe Smith Contact Phone: (907)-555-8541	Assessed Value: \$900K Owner: City of House Currently Zoned: Commercial Investigation Status: Complete Remediation Necessary?: Remediation Status: Complete Contact Email: jsmith@housesny.gov Contact Fax: (907)-555-8302 Photo															
For more detail about this property, go to: www.housesny.gov/tildenrd																
Tax Information																
Tax parcel number (s): XXXXXXXX Are property taxes current? Yes Date taxes last paid: 08/01/1998 Any easements in effect? No Is a copy of the title insurance policy available? No	Amount of annual property taxes: \$.XX Amount owed: \$0.00 Any liens or judgements in effect? No Any land use or deed restriction in effect? No Any land use or deed restriction in effect? No															
Property History																
What year was the property first improved? 1974 Has property use or ownership changed? Yes	How many years has the property been in operation? 24 <table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <thead> <tr> <th>Years</th> <th>Owner name</th> <th>Type of use</th> </tr> </thead> <tbody> <tr> <td>1974-1982</td> <td>Mr. Smith</td> <td>Commercial</td> </tr> <tr> <td>1982-1990</td> <td>Mr. Jones</td> <td>Commercial</td> </tr> <tr> <td>1990-1998</td> <td>Ms. Johnson</td> <td>Commercial</td> </tr> <tr> <td>1998-current</td> <td>City of House</td> <td>Commercial</td> </tr> </tbody> </table>	Years	Owner name	Type of use	1974-1982	Mr. Smith	Commercial	1982-1990	Mr. Jones	Commercial	1990-1998	Ms. Johnson	Commercial	1998-current	City of House	Commercial
Years	Owner name	Type of use														
1974-1982	Mr. Smith	Commercial														
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1998-current	City of House	Commercial														

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Figure 4. (continued)

Transportation	
<p>Traffic study completed? Yes</p> <p>Public transportation: On property</p> <p>Airport access: 7 mi.</p>	<p>Interstate access: On property</p> <p>Water-front access: On property</p> <p>Rail: 17mi.</p>
Market Information	
<p>Is a zoning change required? No</p> <p>Has a development plan been completed? Yes</p> <p>What is the highest and best end use? Commercial</p>	<p>Has a developer been identified? No</p> <p>Has a market study been completed? Yes</p> <p>Transfer options available: Owner wants to sell</p>
Utilities	
<p>Public water: Nearby and easy to extend</p> <p>Electricity: On property</p>	<p>Public sewer: On property</p> <p>Gas: Not in area</p>
Environment	
<p>Wetlands: No</p> <p>Endangered species present: No</p> <p>Located within 100-year flood plain: No</p> <p>What is the highest and best end use? Commercial</p>	<p>Sensitive ecosystem or habitat present: No</p> <p>Historic or archaeological properties present: No</p> <p>Located within 500-year flood plain: Yes</p>
Remediation studies and status	
<p><u>Phase I-ESA (ASTM 1527-97) completed?</u> Yes</p> <p><u>Copies of reports available?</u> Yes</p> <p>Is remediation in progress? No</p> <p>What lists is the property found on? NPL, RCRA</p>	<p>Phase II or subsequent investigation completed? Yes</p> <p>Is property entered in a State Voluntary Cleanup Program? No</p> <p>Is regulatory sign-off completed for this property? Yes</p> <p>Has the property ever been in litigation? No</p>
<p>Location Property Tax Information History Transportation Market Information Utilities Environment Remediation Photo</p>	
<div style="border: 1px solid black; padding: 2px 10px; display: inline-block;">Close</div>	

information described. The second method is to link directly into the database of the data provider. The user would have immediate access to all available information; and no additional searching would be necessary. The second method has obvious advantages for the user, but it is much more complicated from a programming perspective. The method requires a high level of cooperation between the operators of a web site of brownfields properties and data providers. In many cases, technical obstacles may make the second method impractical. The overview of the property also may include a direct link to reports and studies about the property that are available electronically, or provide information on where these reports and studies can be found.

2.5 REGISTRATION FUNCTION AND AUTOMATIC E-MAIL NOTIFICATION

One step to increase user interest in a brownfields property web site is to provide the capability for users to receive e-mail notifications when new properties are added to the database. This feature of the web site could be made available to users who choose to register by entering contact information (name, organization, and e-mail address). The e-mail notification process should be automated. When a new web site is launched, users may be discouraged from returning to the site if the initial number of properties listed is small. The e-mail function will help to recapture users as new data are added to the database. After the number of listings increases significantly, the e-mail notification function can be modified to notify users about new listings of properties that meet specific parameters identified by the user. For example, the user could be notified only if a property added to the database has characteristics that match the search criteria previously established by the user.

2.6 DATA PROVIDERS (ADD/UPDATE RECORDS)

To add properties to the database, data providers could be provided with options. The number and types of options should be dependent upon the potential number of data providers, whether the database will be local, state, regional, or national, and the extent of quality control of the data. For example, the following options might be appropriate for a state or national database:

1. Use a web-based data entry form. The data provider simply fills out the form on the web page. The data are added to the database when the user clicks an "Update" button at the bottom of the screen.
2. Download a copy of the web site's data structure in an MS Access format. A simple user guide (one or two pages) providing technical guidelines for either a novice user or a

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database specialist could be prepared and made available for downloading along with the MS Access database. After all data have been transferred into the MS Access database, the data provider sends the MS Access database back to the operator of the web site by e-mail or file transfer protocol (FTP). The option allows the data provider to complete the file when convenient and to generate their own copy of the information provided.

3. Submit large volumes of data in digital format, such as MS Access or ASCII comma delimited. The data could then be imported into the database for the web site.

To help ensure data quality and security, each data provider should be given a password, automatically generated by the system. Data providers must use their passwords to gain access to their records. Use of a password ensures that unauthorized persons will not be able to alter information about properties. At any time, data providers should be able to return to the web site to modify or update the information they have submitted. Data providers should be required to return to the site on a routine basis, such as, at least once every six months to keep records current. The status of a record could be listed as “Active,” “Inactive,” or “Sold.” Active sites could be those sites that currently are for sale. Inactive sites could be sites that have been or may become available for sale, but currently are not for sale. Sold sites could be sites that have been sold and are no longer available to purchase. Data providers should be free to change the status at any time.

2.7 WEB SITE ADMINISTRATION

A web site should include a web page that can be used for administration purposes and not accessible to the public. It should be accessible only to approved administrators who need instant access to information about the performance of the web site. Access to the administrative page can be controlled through a login screen.

Use of a web site should be logged to gain a better understanding of how users might benefit from a brownfields property web site. System administrators could use the record of user activity to identify functional areas that require improvement. An administrative web page could include the following features:

- A summary of the system use logs,
- Functions for adding, deleting, and updating all records
- Functions for controlling e-mail notifications to registered users and data providers

3.0 DATA DESCRIPTION AND ORGANIZATION

This section describes the data structure of the web site design prepared by EPA and procedures for managing data and maintaining a web site.

3.1 DATA STRUCTURE

An Oracle database could be structured to make the best possible use of other potential sources of data, such as the New Jersey Brownfield Site Marketing Inventory and Pennsylvania's Land Recycling Program.

Table 1 shows those suggested fields that should be completed to list a property in the system. Of the 13 data elements shown in the table, 10 can be used as search criteria.

Table 1
Suggested Data Elements That Should Be Listed for Each Site

Field Name	Detail	Definition
1. Site Location	Street name or route number of nearest highway <Text>	Name of street on which the property is located, or for remote locations, the name or route number of the nearest highway.
	*2. City <Text>	Name of the city in which the property is located.
	*3. County <Text>	Name of the county in which the property is located.
	*4. State <Two-letter code>	Name of the state in which the property is located.
	*5. Zip code <Five or nine numbers>	Five- or nine-digit Zip code in which the property is located.
*6. Site Size	Acreage <Quantify> or Square feet <Quantify>	Total area that is available for redevelopment at the site.
*7. Ownership	" public " private	Indicates whether the owner of the property is a public or private entity.
*8. Proposed Zoning	" industrial <Check appropriate box> " commercial " residential " retail " mixed use " other	When a master plan for redevelopment has been approved for the area in which the property is located, indicate the proposed zoning for the property. When no master plan has been approved, enter the likeliest option for zoning of the area.
*9. Status of Site Investigation	" in process <Check appropriate box> " complete	Indicate the current status of studies to characterize the level and types of contaminants at the property.

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Field Name	Detail	Definition
*10. Status of Remediation	" in process <Check appropriate box> " complete	Indicate the current status of activities to clean up contaminants at the property that must be treated or removed before redevelopment can begin.
*11. Redevelopment incentives	" local <Check one or more boxes> " state " federal " loans " tax relief " grants " bonds " VCP " comfort letter	Indicate the local government, state, and federal incentives that have been approved or are available to encourage redevelopment of the site.
12. Site Contact Name	First name <Text> Last name	Name of person who can provide additional information about the site.
13. Site Contact Phone Number	Telephone number	Telephone number of contact person

* Searchable information

3.2 DATA MANAGEMENT AND SITE MAINTENANCE

Web sites that include information about brownfields properties should be designed in a manner that will minimize the time required for data management and site maintenance. A routine schedule of data management tasks is necessary to insure that the database remains current. Outdated records must be deleted, and new sites must be added to the database. Insofar as possible, the data management process should be automated. Outdated records should expire automatically after a reasonable time period, such as three months. Each quarter, automatic e-mail notifications should be used to warn data providers that their records are about to expire. After receiving e-mail notification, the data provider should be required to return to the web site to delete outdated records and to renew records that should remain active.

Although automation will reduce the time required for data maintenance, database specialists may be required to validate new records and to perform certain data conversion or manipulation tasks. The database is not likely to grow quickly if users are required to enter all new records one at a time, using the web page data entry form. Therefore, if the user has more than 20 new sites to add to the database, the user should have the option of providing data to the system operator in an MS Access data structure that can be downloaded from the brownfields property web site. The user can update the MS Access database by manually entering records on predesigned forms. As an alternative, the user could update the database using standard functions of MS Access. The updated MS Access database could be sent to the system operator through e-mail or FTP. Database specialists for the system operator could import the new data

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into an Oracle database. If the user has more than 100 new sites to add to the database, the user can provide the system operator with a data dump in any digital format, including MS Access, MS Excel, Oracle, or delimited text files. Database specialists could then convert the data into a usable format and import the data into the database.

Table 2 presents a sample data update cycle. The data maintenance cycle is the time elapsed from the date on which the brownfields property web site receives the data and the date on which the data become “Active” in the database. Only “active” records should be visible to users.

Table 2
Sample Data Maintenance Cycle

Method of Data Capture	Data Update Cycle	Advantages	Limitations
Web-based data entry form.	1 week	Anyone who has access to the Internet can add new properties to the database. Data entered are posted to the database immediately.	The process of entering information can be slow and time-consuming, particularly when the user is adding a large number of records. Although data are posted to the database immediately, the data must be reviewed before the listing becomes active and is made available to the public.
MS Access (downloaded from web site)	3 weeks	Large amounts of data can be imported into MS Access through standard data manipulation techniques. The process is less time-consuming than entering data through a web-based form.	Novice computer users may not prefer this option. A user who has only one or two new properties may prefer to use the web-based form rather than MS Access.
Data dump	3 months	Data providers are not required to perform any data entry. The process will allow the transfer of large amounts of data.	The process of importing data may be labor-intensive for the system operator. The process is beneficial and cost-effective only if the data dump includes a large number of properties.