

e-KIT: An Electronic-Knowledge Information Tool for Organizing Site Information and Improving Technical Communication with Stakeholders – 13082

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ABSTRACT

Managing technical references for projects that have long histories is hampered by the large collection of documents, each of which might contain discrete pieces of information relevant to the site conceptual model. A database application has been designed to improve the efficiency of retrieving technical information for a project. Although many databases are currently used for accessing analytical and geo-referenced data, applications designed specifically to manage technical reference material for projects are scarce. Retrieving site data from the array of available references becomes an increasingly inefficient use of labor. The electronic-Knowledge Information Tool (e-KIT) is designed as a project-level resource to access and communicate technical information. The e-KIT is a living tool that grows as new information becomes available, and its value to the project increases as the volume of site information increases. Having all references assembled in one location with complete reference citations and links to elements of the site conceptual model offers a way to enhance communication with outside groups. The published and unpublished references are incorporated into the e-KIT, while the compendium of references serves as a complete bibliography for the project.

INTRODUCTION

DOE's Office of Legacy Management (LM) identified the need for having a resource tool that would provide a high-level summary of information that is critical to understanding a site. This need was identified after responsibility for the environmental site restoration of the Offsites project was transferred from the DOE Office of Environmental Management to LM. The Offsites project includes eight sites outside the Nevada National Security Site (formerly the Nevada Test Site) that were used for underground nuclear testing. The Offsites are good examples of projects that have had a long and extensive history with numerous contractors and technical reports. The underground nuclear tests were conducted at these sites in the 1960s and early 1970s, and pretest evaluations for selection of the sites were often initiated in the 1950s. Through the years, many contractors were involved with the different phases of the projects, including pretest evaluation, underground testing, site cleanup and decommissioning, and environmental site restoration. The contractors often included other federal agencies such as the U.S Geological Survey, U.S. Bureau of Mines, and Desert Research Institute, as well as private companies that were often subcontracted to the federal agencies. These agencies and subcontractors completed numerous technical reports

summarizing geologic, hydrologic, geophysical, and analytical data obtained from the sites. These data, with the exception of analytical and geo-referenced data, are typically not captured in a database but are often critical components in the development and evaluation of a project's site conceptual model.

Managing the technical references for a project, such as the Offsites project, often has its challenges with respect to recalling pertinent technical data, locating information efficiently, identifying information that is critical to a project's site conceptual model, and communicating this information to project participants and stakeholders. The ability to address these basic challenges is critical in managing a project successfully. The electronic-Knowledge Information Tool (e-KIT) is designed as a resource to help meet these challenges while providing an interactive format for sharing and communicating information with the project participants and stakeholders.

OVERALL e-KIT FRAMEWORK

The e-KIT was designed and constructed using Microsoft Excel. The spreadsheet program was selected because it provides a convenient format for organizing information and data within individual worksheets or tabs, but other programs such as Microsoft Word or Access could have been used. Individual worksheets in Excel function as notepads that organize and highlight important information or data obtained from historical reports. The worksheets are completed to provide necessary reference information with page numbers for important citations so the user can refer to the referenced material for further information. Worksheets provide the ability to chart data, create tables, and sort information needed by the user. Hyperlinks are used to navigate within the spreadsheet and access documents or supplemental information that is specific to a project. The e-KIT was broadly designed to work with existing databases and to enhance the networking of project-specific information. Macros are used to link to the LM Geospatial Environmental Mapping System (GEMS) and Site Environmental Evaluation for Projects (SEEPPro) databases. The following sections provide an example of how the e-KIT was developed for one of the Offsites and how specific information was captured within the e-KIT framework.

Project Shoal e-KIT

Project Shoal is an Offsites project that was recently transferred to LM. Shortly after the transfer, it became apparent that the closure strategy needed to be revised because the site conceptual model and subsequent numerical model were not adequate. It was determined after negotiations with the Nevada Division of Environmental Protection that a new strategy needed to be developed that would focus on revising the site conceptual model and evaluating the adequacy of the monitoring well network. LM proceeded to evaluate further analytical, hydrologic, and geologic data, along with recently acquired geophysical data to advance the site conceptual model. The e-KIT was developed to organize the many references while highlighting key information that is critical to understanding the site and revising the site conceptual model.

The flow chart on the Startup page provides the framework for categorizing and grouping important elements of a project. Figure 1 shows the highest-level worksheet, or Startup page, for the Shoal site. In this example, there are five main categories for grouping information about the site. Other sites may have more or fewer categories. The main categories for the Shoal site consist of hydrologic, regulatory, source, geophysics, and geologic information. These general categories are subdivided into more detailed lists of specific information or data associated with each category (Figure 2). Hyperlinks on the Startup page are used to direct the user looking for specific information to the Notes page. Worksheet tabs are color coded to correspond with the main categories on the Startup page to help the user navigate within the spreadsheet and find information quickly. An advantage of the e-KIT design is that placeholders can be created for specific information that is not ready to be linked, either because the information is not yet available or because existing information has not yet been gathered and prepared for linking. (The e-KIT design uses the familiar blue-underlined font to indicate a hyperlink, and plain black font to indicate an item not yet linked.) Being able to create placeholders for non-linked (unavailable) types of information makes the early stages of design more efficient.

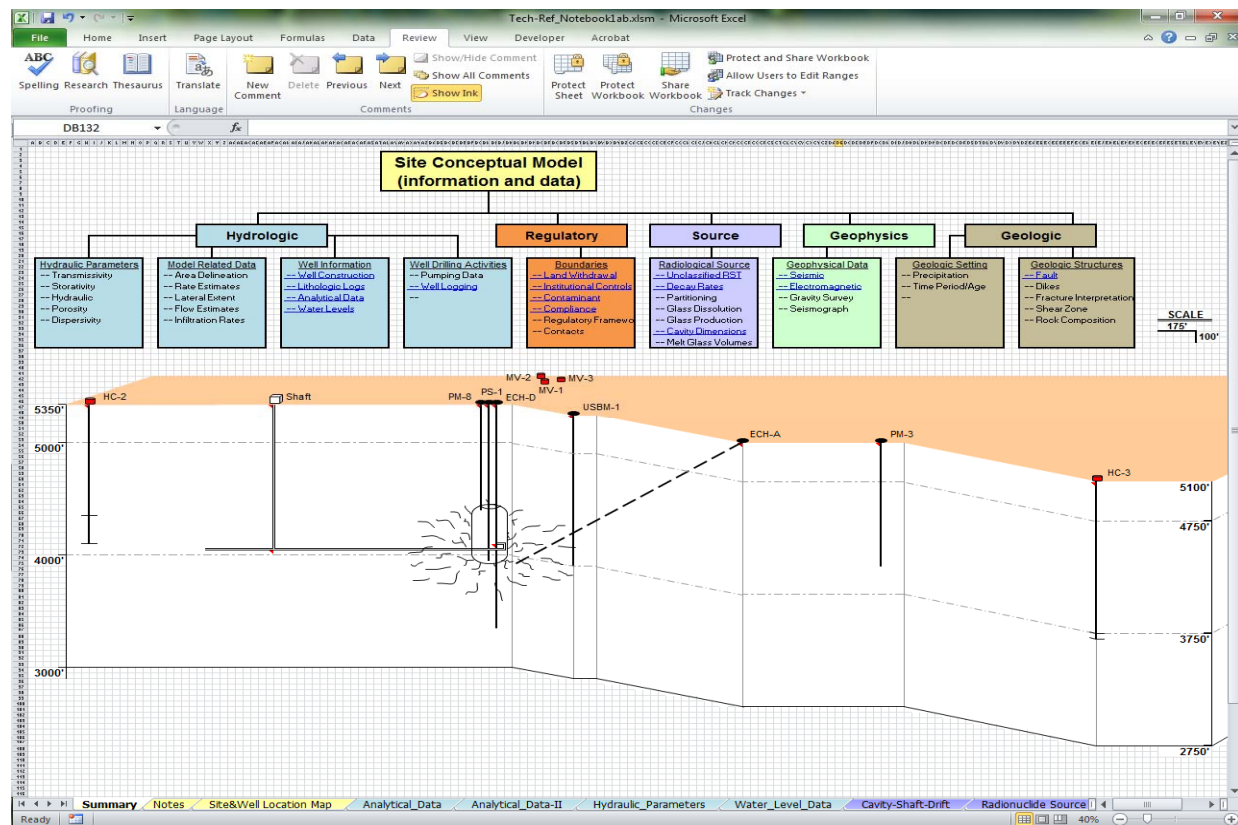


Figure 1. e-KIT Startup page.

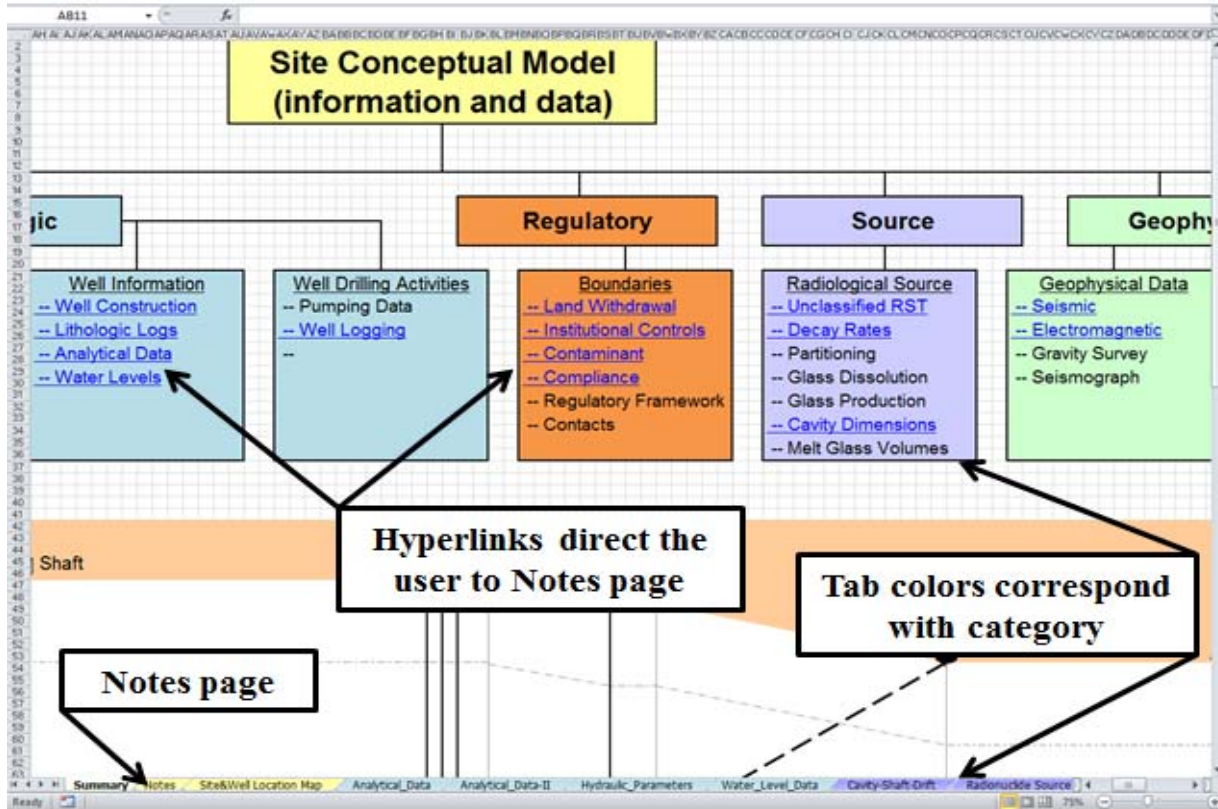


Figure 2. Detailed view of the e-KIT Startup page.

The Notes page functions as the main information center and includes specific information about the category selected from the Startup page. Figure 3 shows a portion of the Notes page for the Shoal site. This worksheet was designed to include tables, charts, and figures that summarize information such as well construction, laboratory analyses, geophysical logs, water levels, and hydraulic parameters obtained for the different wells or boreholes onsite. Hyperlinks on the Notes page allow the user to open specific information, such as lithologic logs or well construction diagrams. Hyperlinks also direct the user to specific worksheets when more-detailed information than that presented on the Notes page is available. For example, from the table that summarizes analyses conducted at each sample location (Figure 3), a hyperlink under the tritium results column takes the user to the analytical data worksheet, where the user is linked to the first tritium result from the selected sample location (well HC-4 in Figure 4). From this worksheet the user can easily chart analytical data from a given well. Macro buttons at the top of the page allow the user to access the GEMS or SEEPro databases for additional analytical data. Photographs are also inserted as screenshots on the Notes page, and basic drawing tools are used to highlight important information.

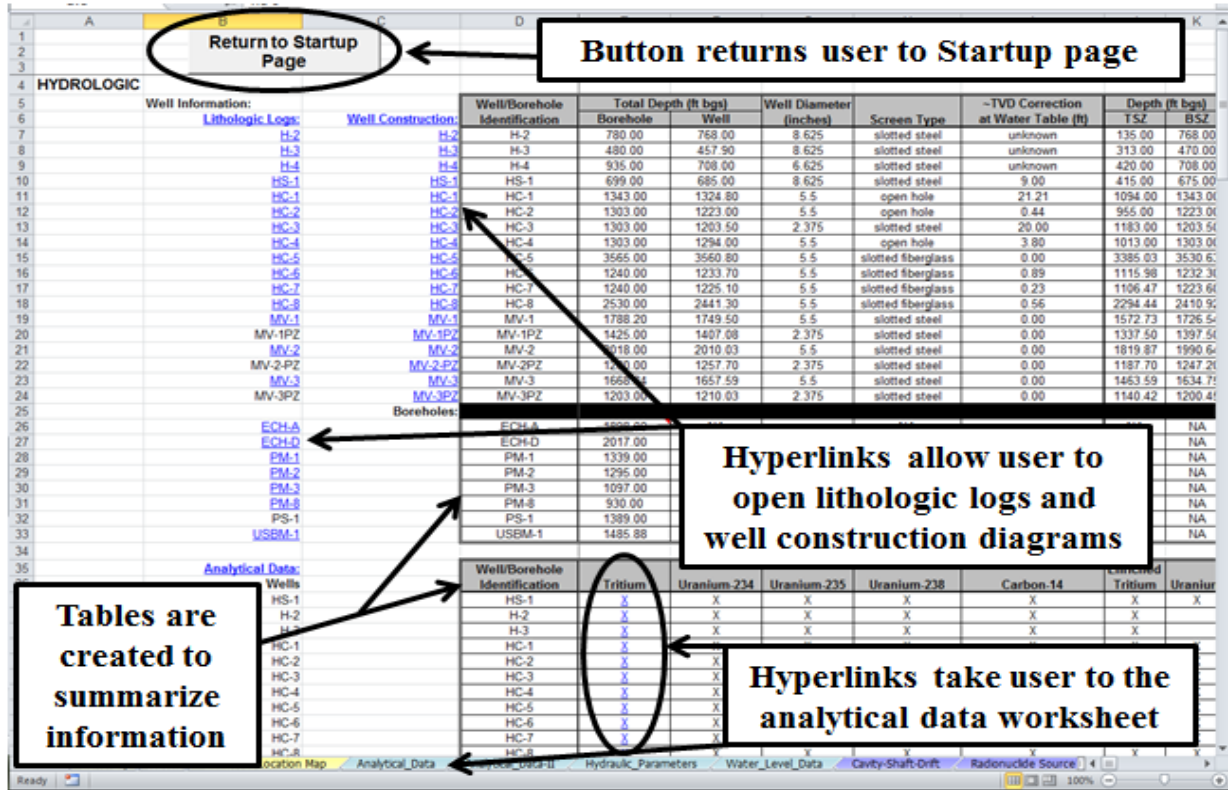


Figure 3. Notes page.

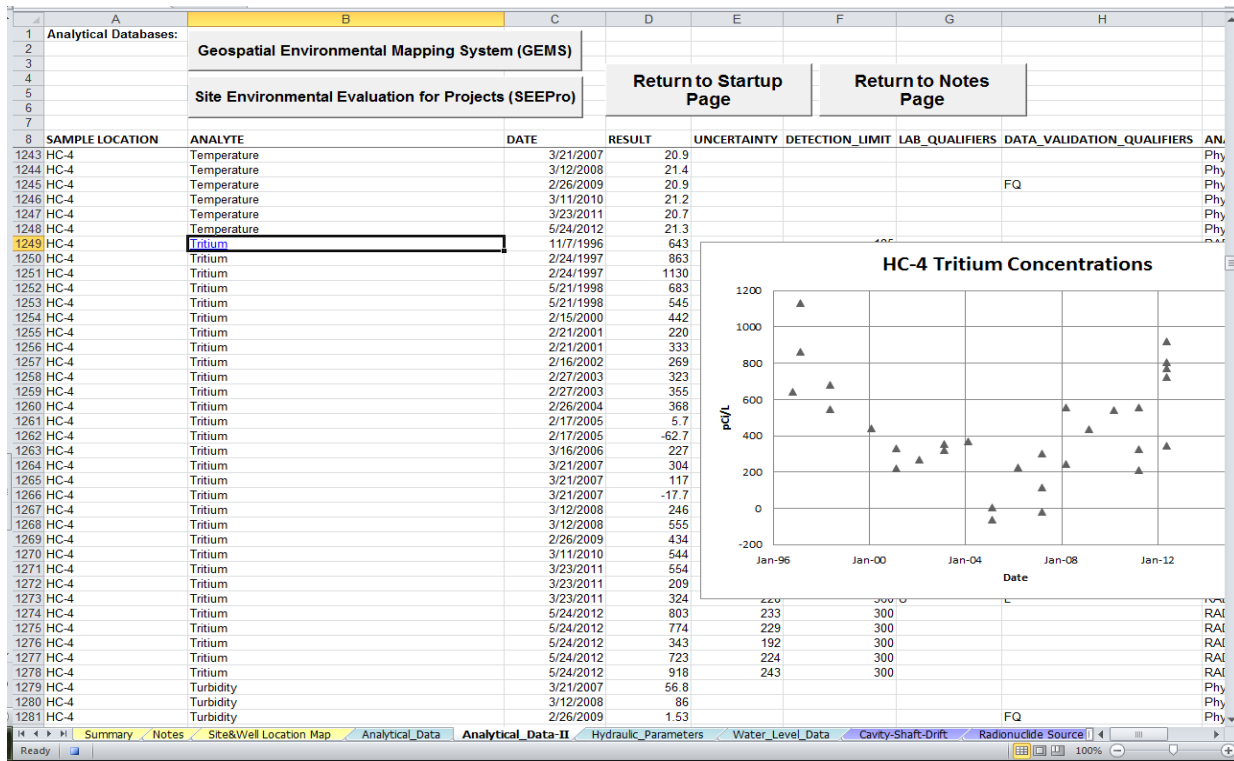


Figure 4. Analytical data worksheet.

The e-KIT includes a Reference page that provides a list of all available references for the project. The references are assembled in one location, and the Reference page provides a complete listing by title, author, document type, and year released. This provides the ability to easily sort the reference materials. Hyperlinks on the Reference page allow the user to open the referenced material (reports, letters, drawings) directly. The published and unpublished references serve as a complete bibliography for the project. Having all references assembled in one location, with complete reference citations, offers a way to enhance communication with outside groups.

CONCLUSIONS

The e-KIT was designed as an interactive organizational tool that functions as a repository for reports and supplemental information, and it provides project personnel quick and easy access to project-related information. It is a living tool that grows as new information becomes available, and its value to the project increases as the volume of site information increases. Available references are assembled in one location and organized by report title, author, document type, and year released. The e-KIT is designed to provide quick access to the essential elements of a project while providing the report reference that conveniently allows project participants to access more detailed information if desired.