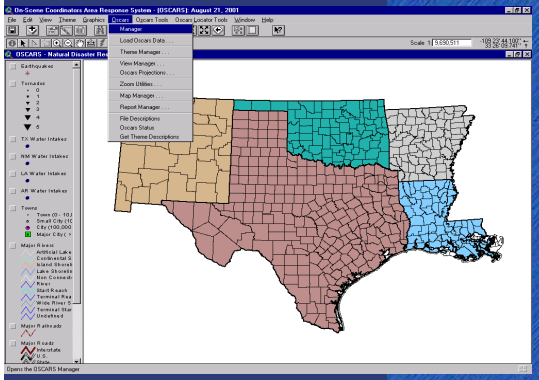
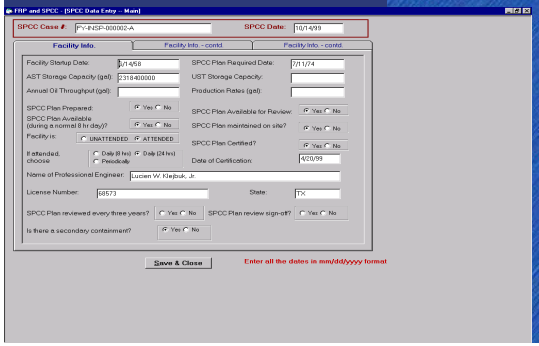




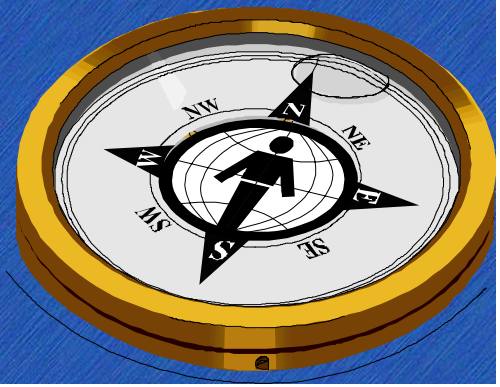
Integrating Information Technology into the Spill Prevention and Response Environment

Donald P. Smith

US Environmental Protection Agency

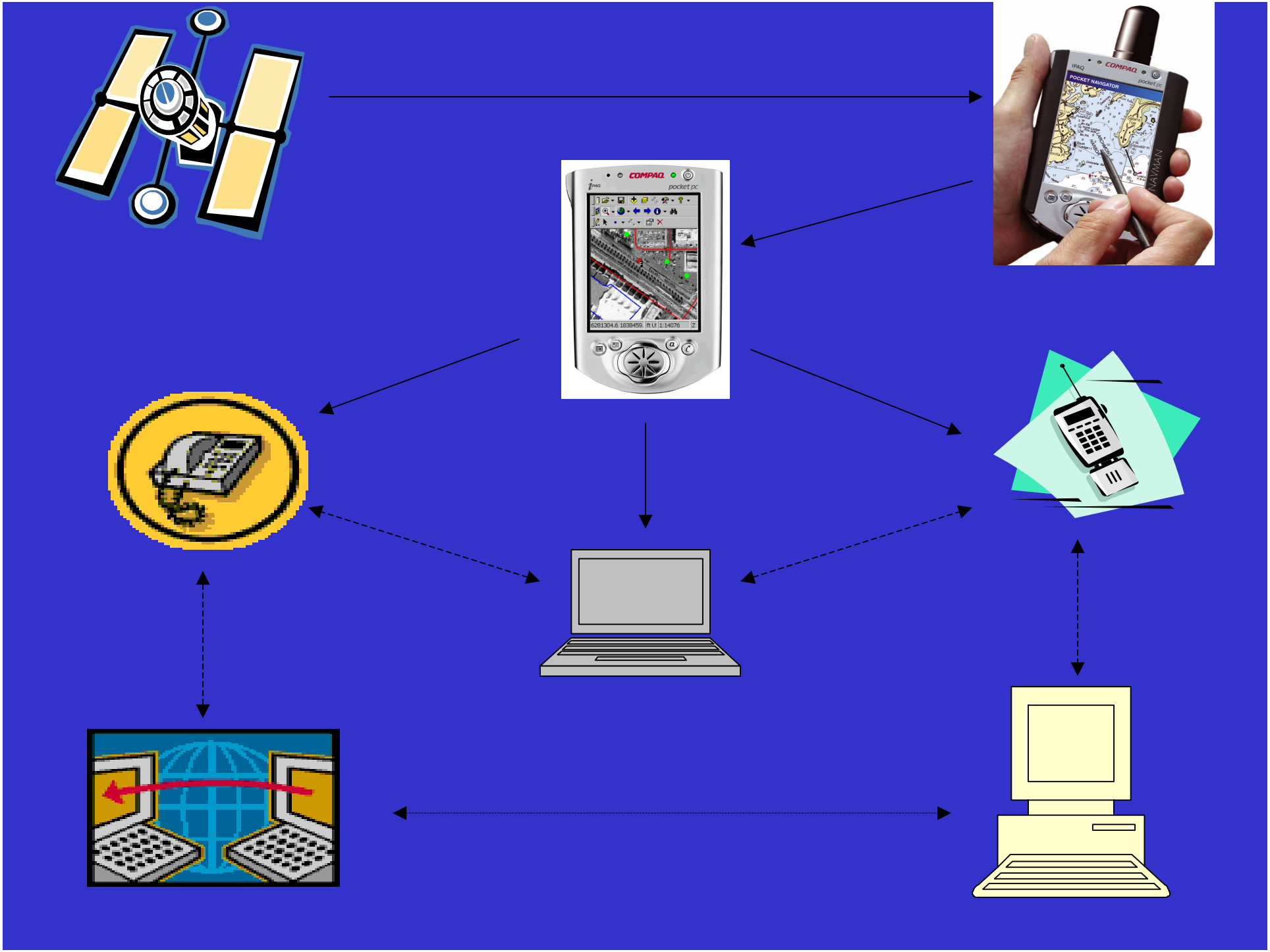
Fresh Water Spill Symposium

March 2002



Presentation Outline

- Developing A Mobile Solution for a Mobile Workforce
- S.W. Arkansas Environmental Improvement Project
- Electronic FRP Management System
- E-Plan Hazmat Site
- Lake Oolagah Remediation Site.
- Presentation Summary


COMPAQ
pocket pc
COMPAQ
POCKET NAVIGATOR
NAVMAN

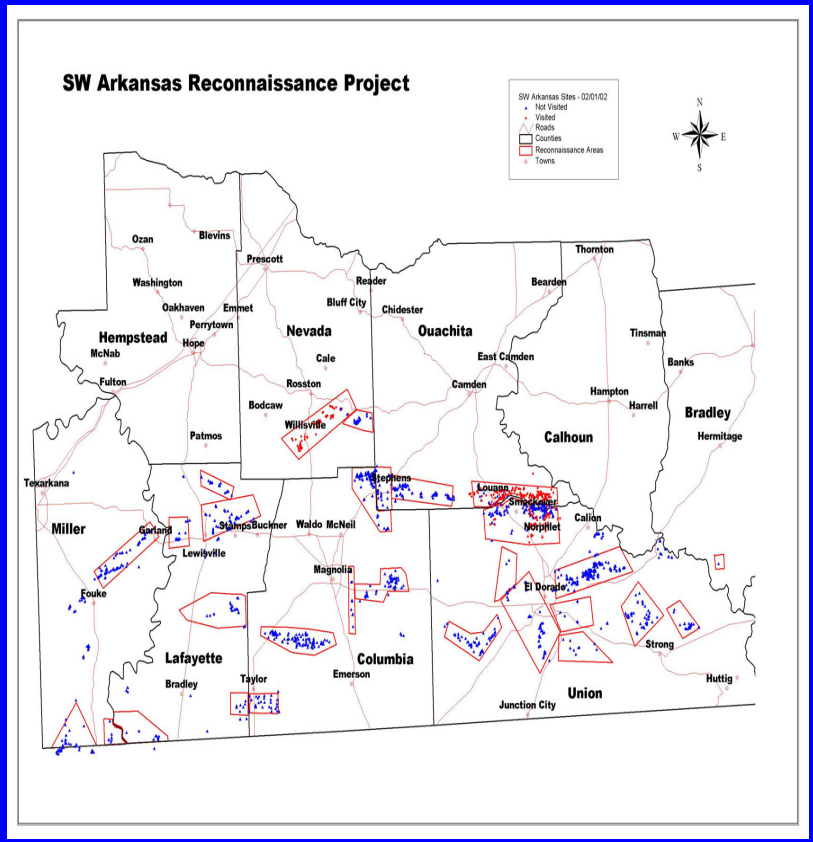
Mobile Strategy

- Identify activities & programs which can benefit from a mobile environment.
- Identify productivity issues.
- Identify areas for increased efficiencies.
- Cost effectiveness.
- Identify the supply/demand factors and the potential user base.

South West Arkansas Environmental Improvement Project

Background

- Six hundred square miles
- Twenty nine identified recon areas covering nine counties in SW Arkansas
- Project Parameters
  - Photographic Analysis
  - Site Assessment/Characterization
  - Responsible Party Identification
  - Site Prioritization
  - Inventory Tracking
  - Site Decision Matrixes
-



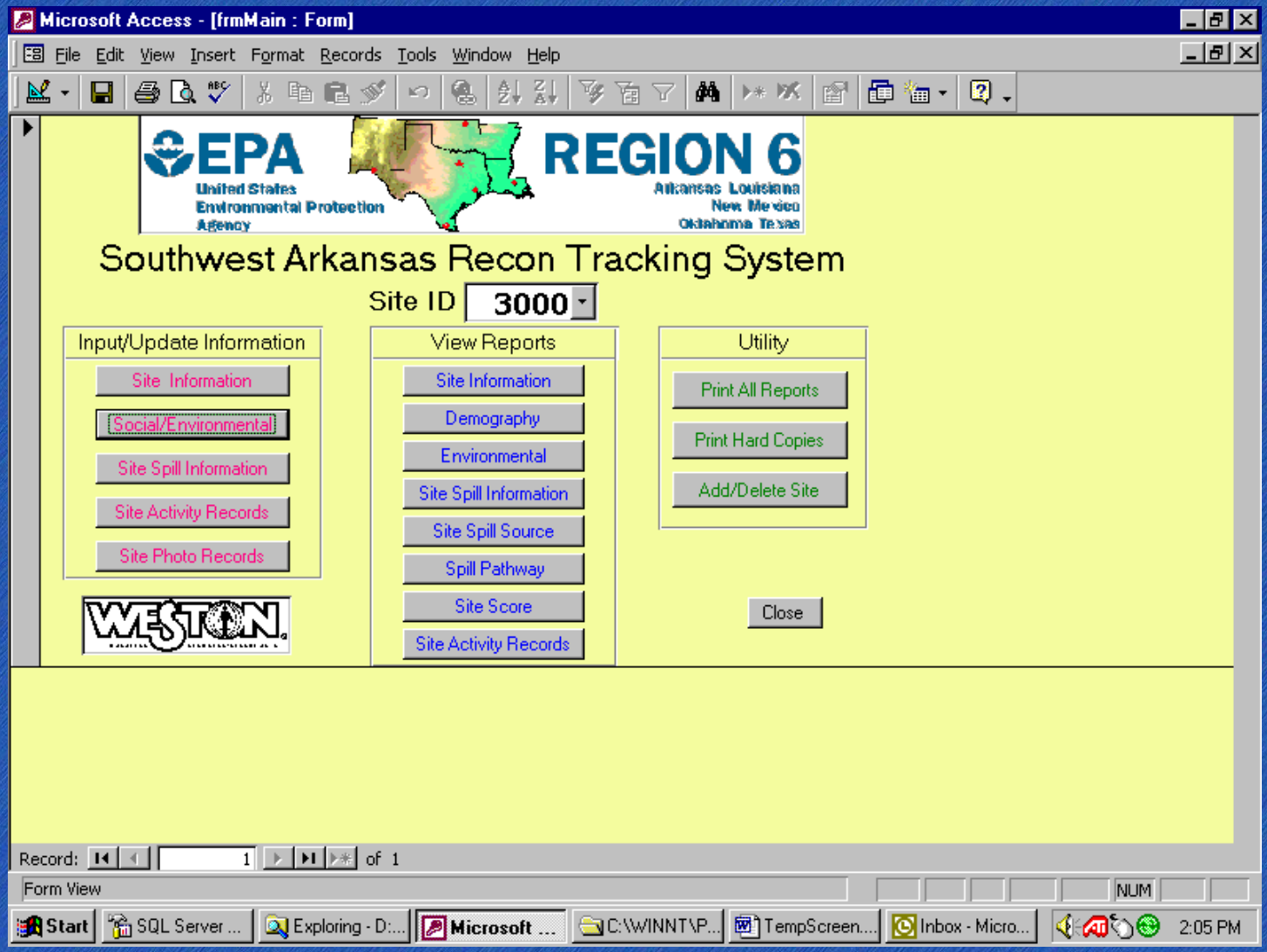
Implementation Breakout

- Project Management
  - Site Assessment Database
    - Hazard Analysis & Evaluation
    - Prioritization
    - Decision Matrix
  - Scheduling & Logistics
  - Geographical Mapping
  - Communications

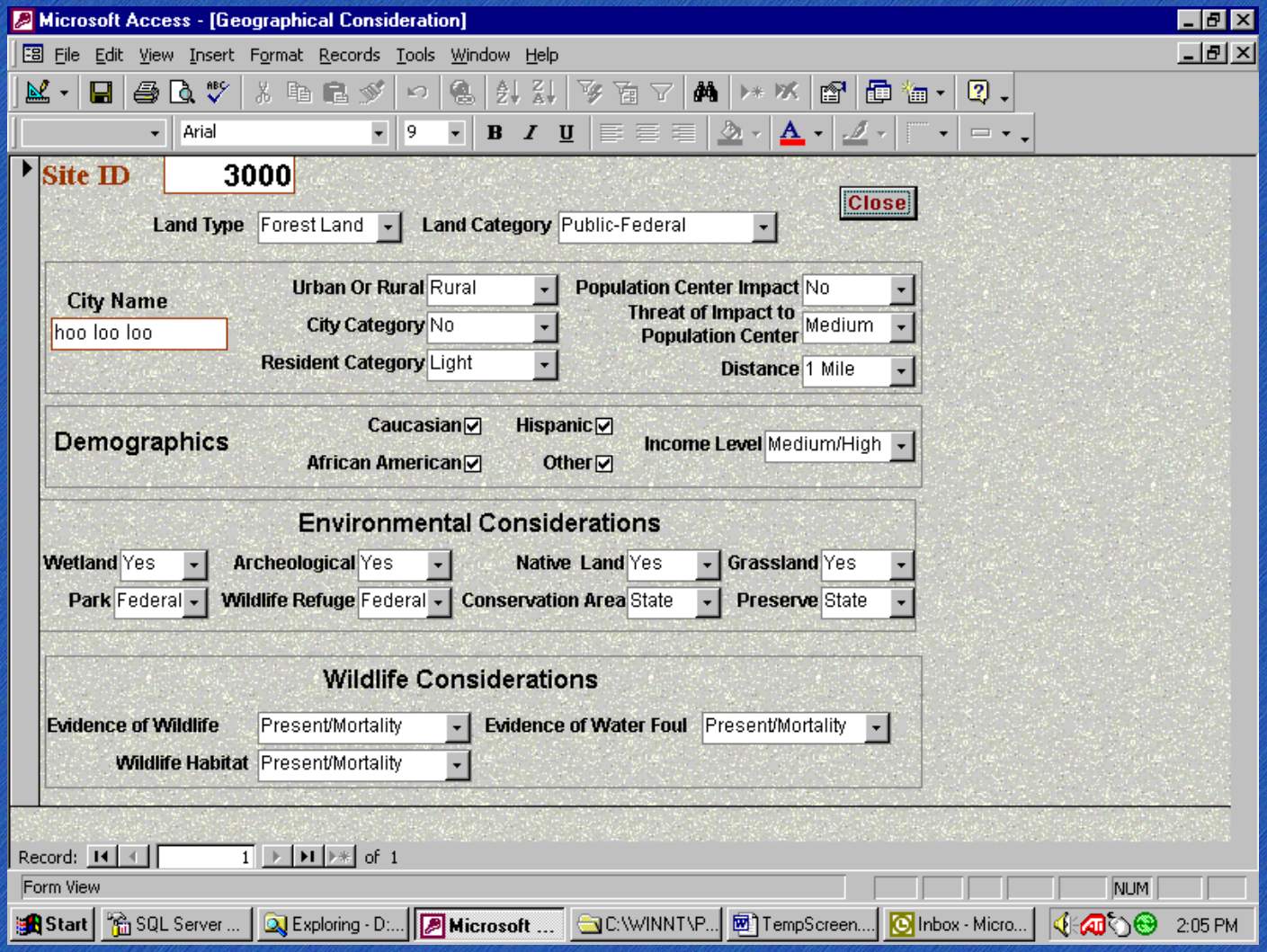
Aerial Photography/Videography

- Geographical area flown utilizing Digital Video/Still Imagery and Global Positioning Systems.
- Data merged into Relational Data Base Management System (RDBMS).
- Site Assessment data collected and merged into RDBMS.
- More than 1900 sites located and classified.
- Data layers created for geographical mapping.

Relational Database Management System



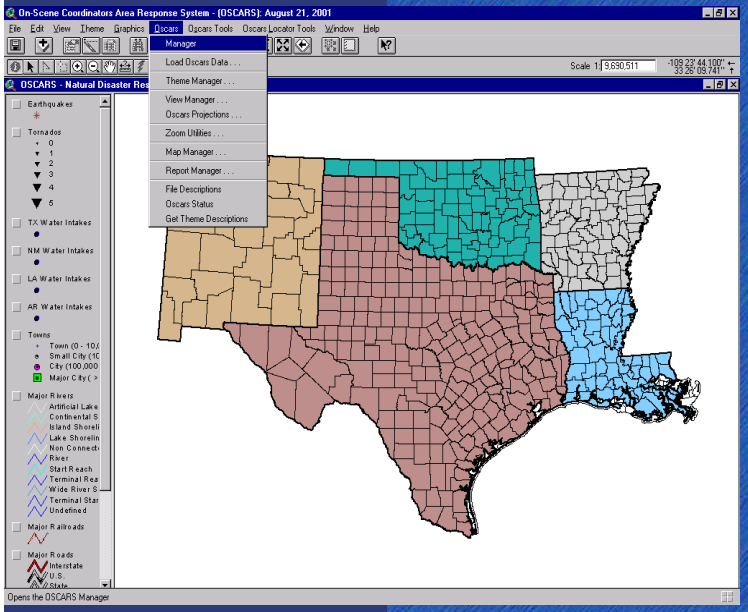
Relational Database Management System

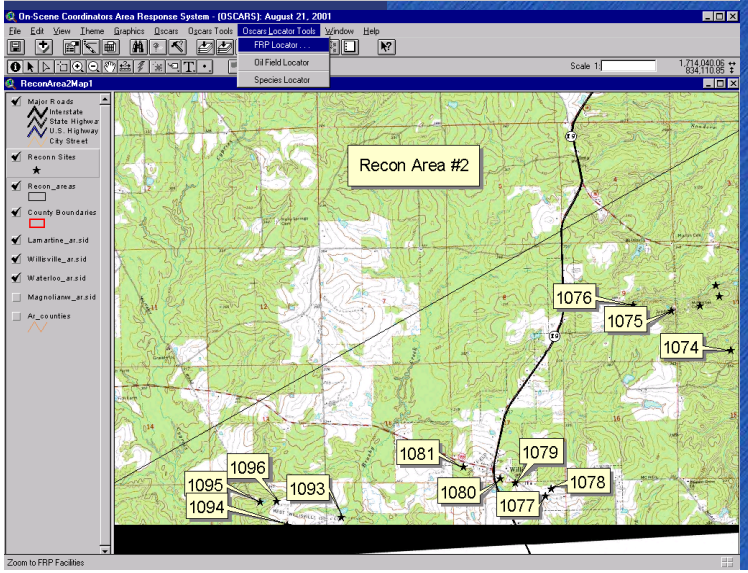


Relational Database Management System

- RDBMS – SQL Server D.B. with access front end/local version.
- Designed to hold site information both pre-inspection and post – inspection.
- Designed to prioritize sites based on different criteria.
- Computes statistics, and pre-formatted reports.
- Determined those sites with most severe contamination.

GIS Development





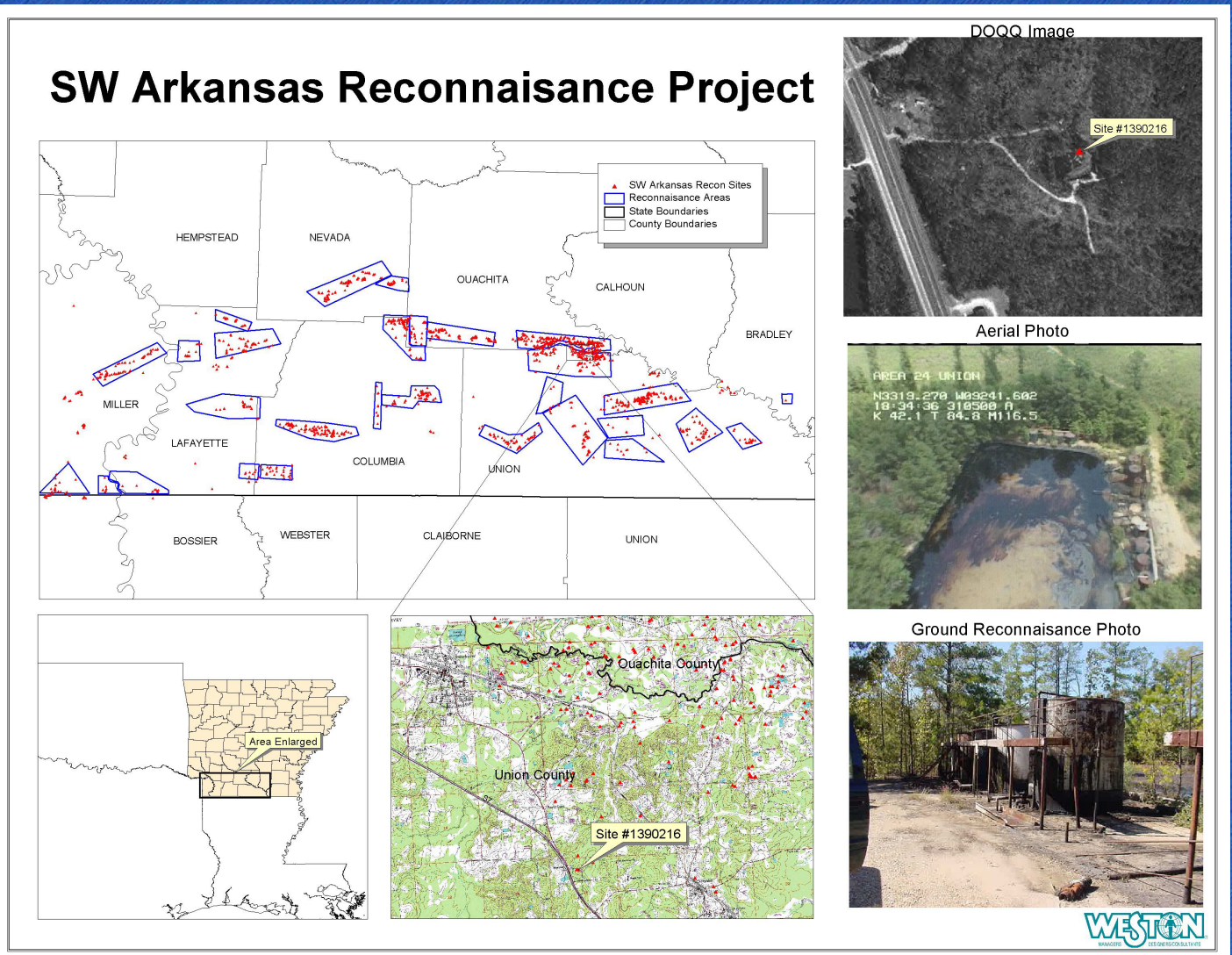
- GIS data layers included sites, roads, TIGER data, and USGS topos in Mr. SID format.

- EPA On-Scene Coordinator Area Response System (OSCARS) GIS application used, with an extension that added special tools.

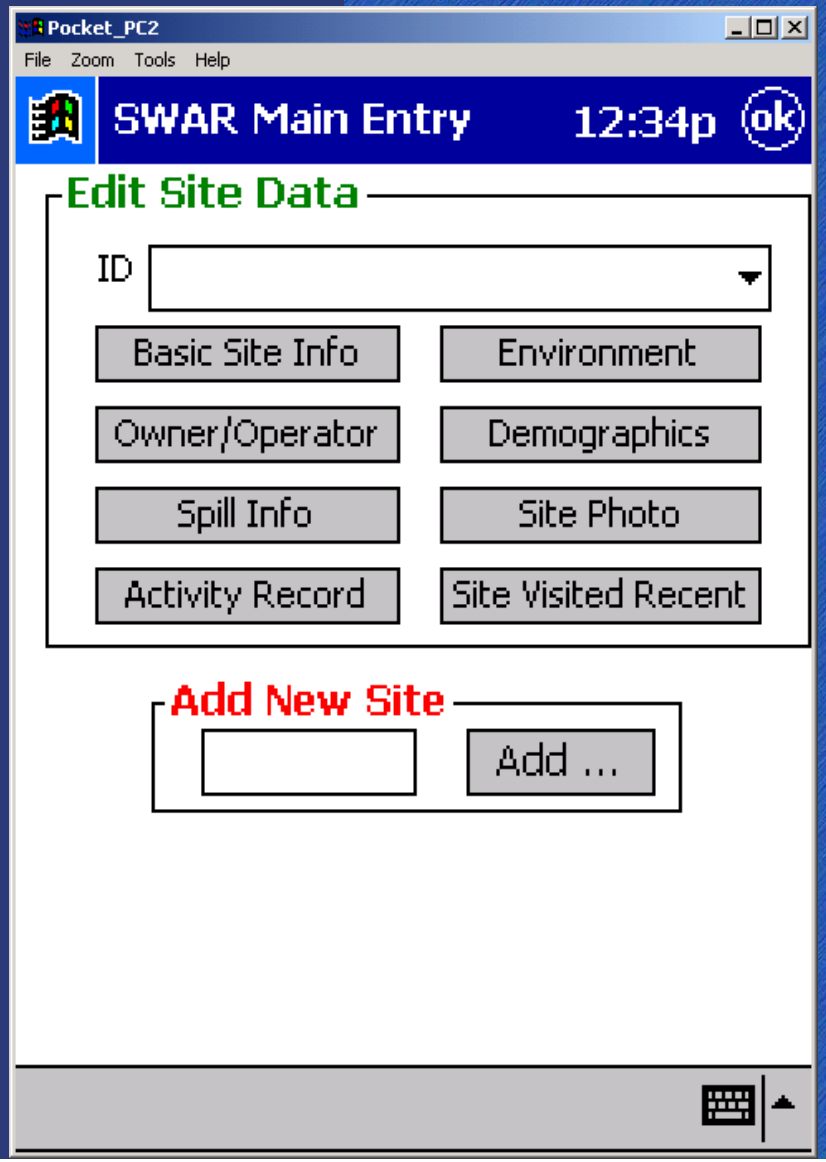
- Sites were brought into GIS using GPS Coordinates.

GIS Development

- GIS Overview Maps
- Field Teams used to locate sites
- GIS application allowed easy retrieval of information

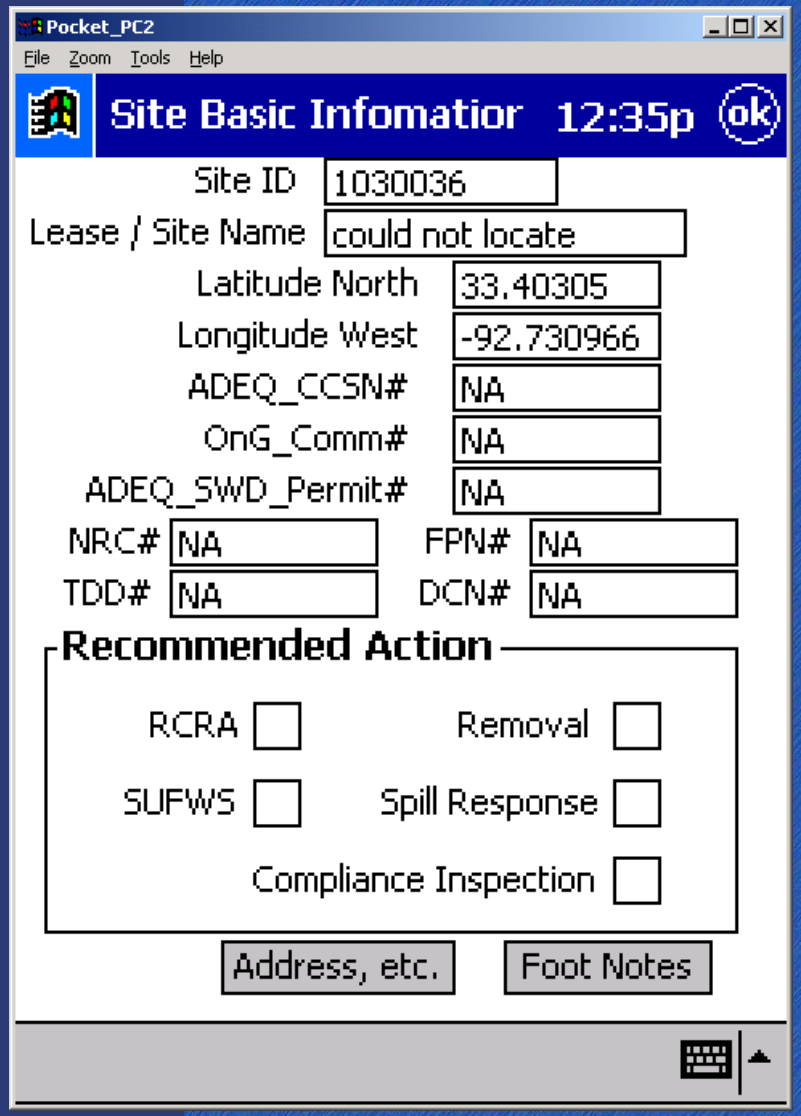


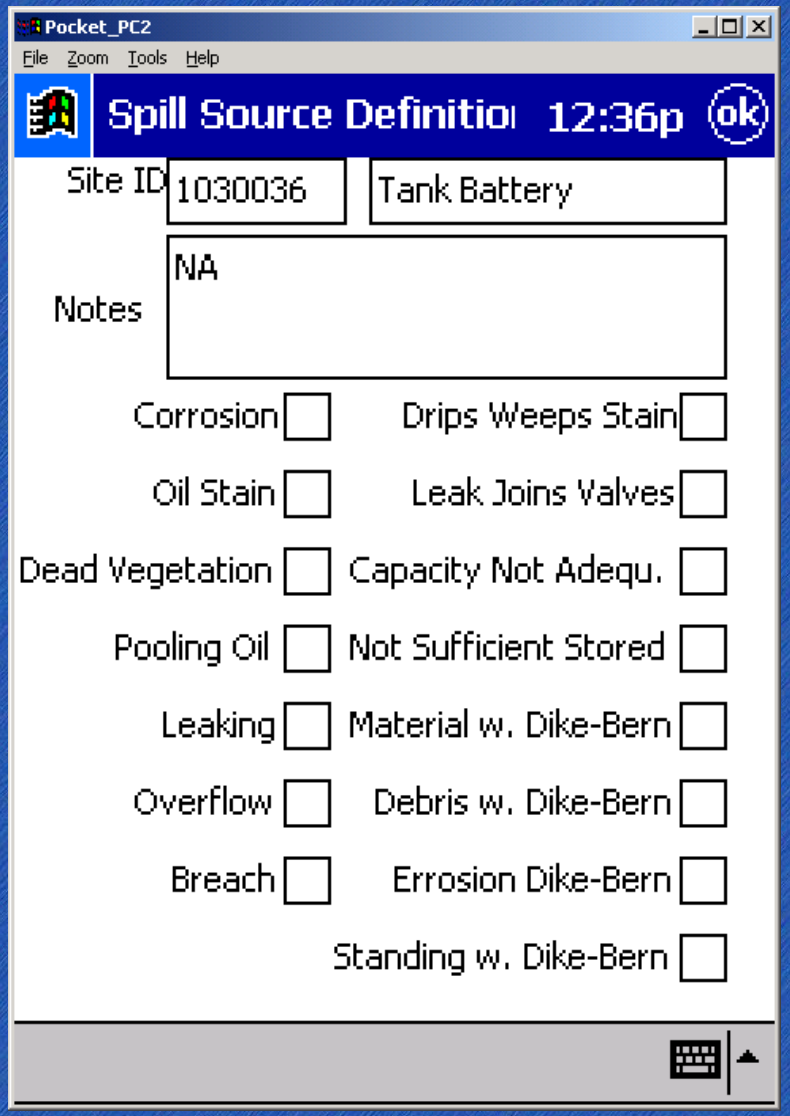
Field Data Collection Solution



- Compaq Ipaq's, with Windows CE as the operating system were used.
- Using Embedded visual tools 3.0, and application was created to support data field data entry
- Active Sync 3.1 used for field synchronization/backup issues.

Field Data Collection Solution



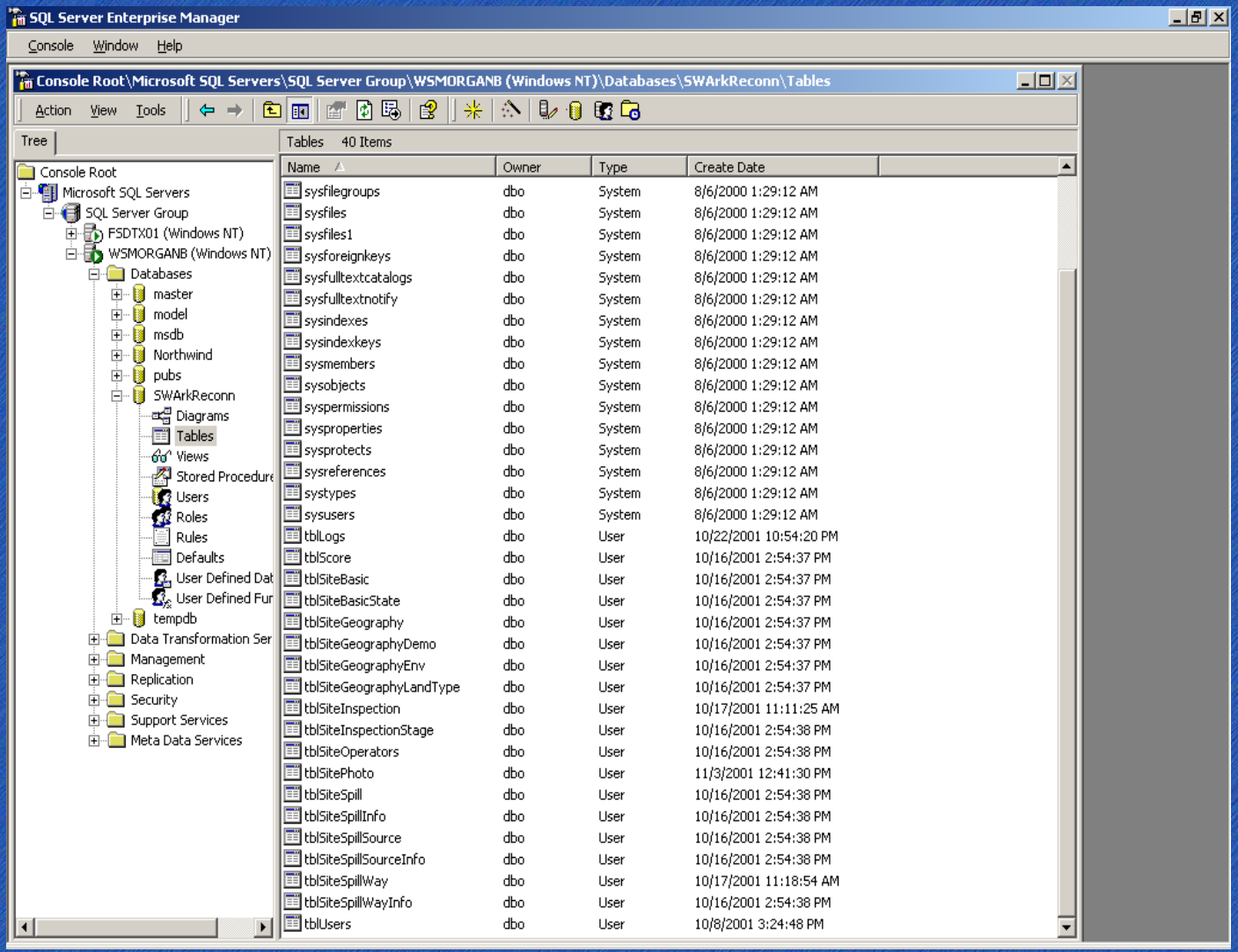


Data Synchronization Issues

- To solve these issues we set up 2 different Windows CE applications.
- Data is synchronized 1 of two ways.
- RDBMS is SQL Server, access version used as a staging cleaning area.
- Field personnel used access version of D.B. to synchronize their data twice a day. This served as a data backup in the field.
- SQL version of application used to synchronize through the web.

Data Validation

- Data synchronized to local access version and validated in office.
- Then the DBA validates data and synchronizes to the SQL RDBMS

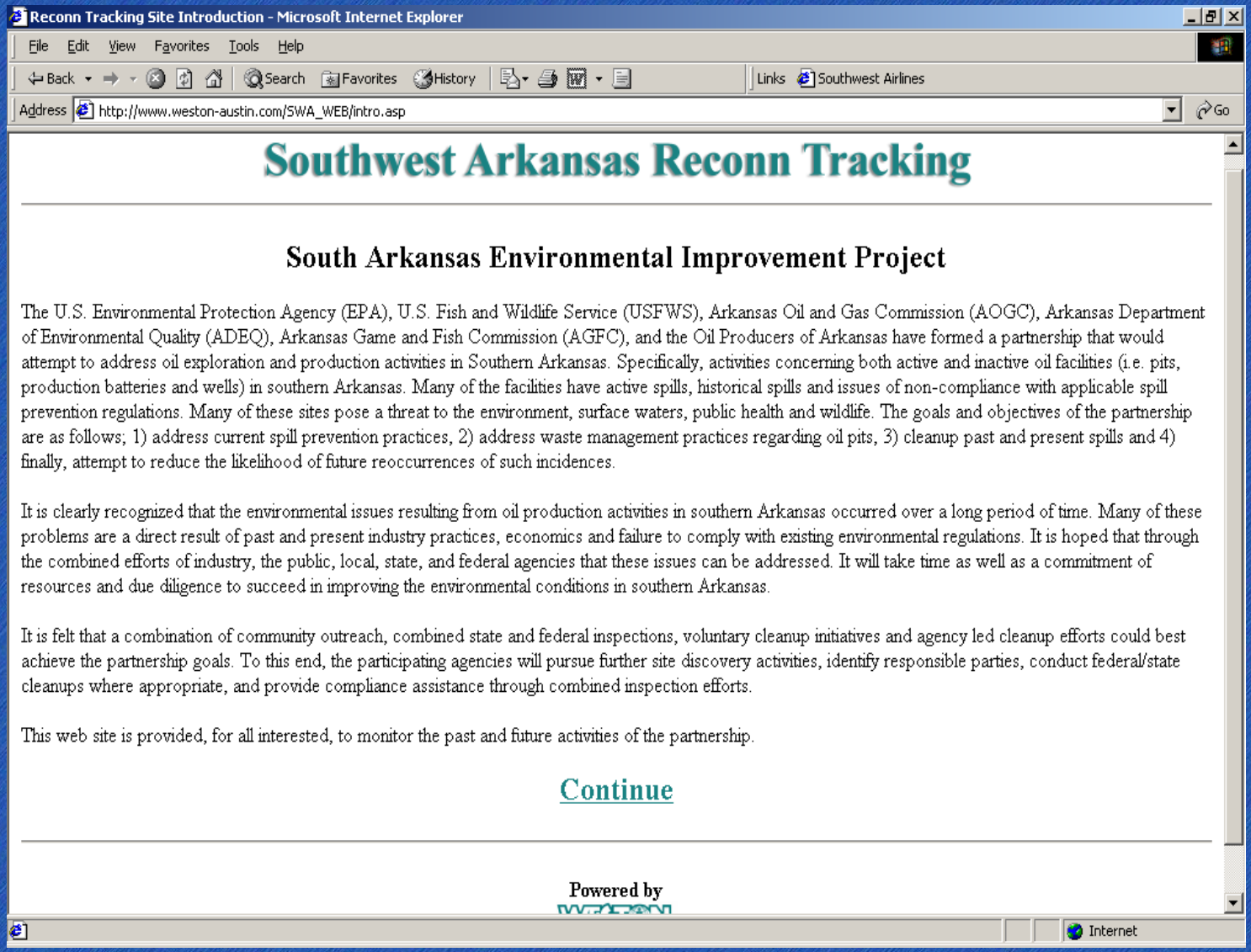


Web Access

- Web page created to inform agencies/facilities involved with initiative.
- Also served as an alternate means of submitting data to the RDBMS.
- Other agencies/organizations could view data, and submit data.
- Once data is synchronized through the web, it goes to a staging area to be validated by DBA.
- Web site includes interactive mapping GIS page. This allows users to find sites through database or via the interactive map.

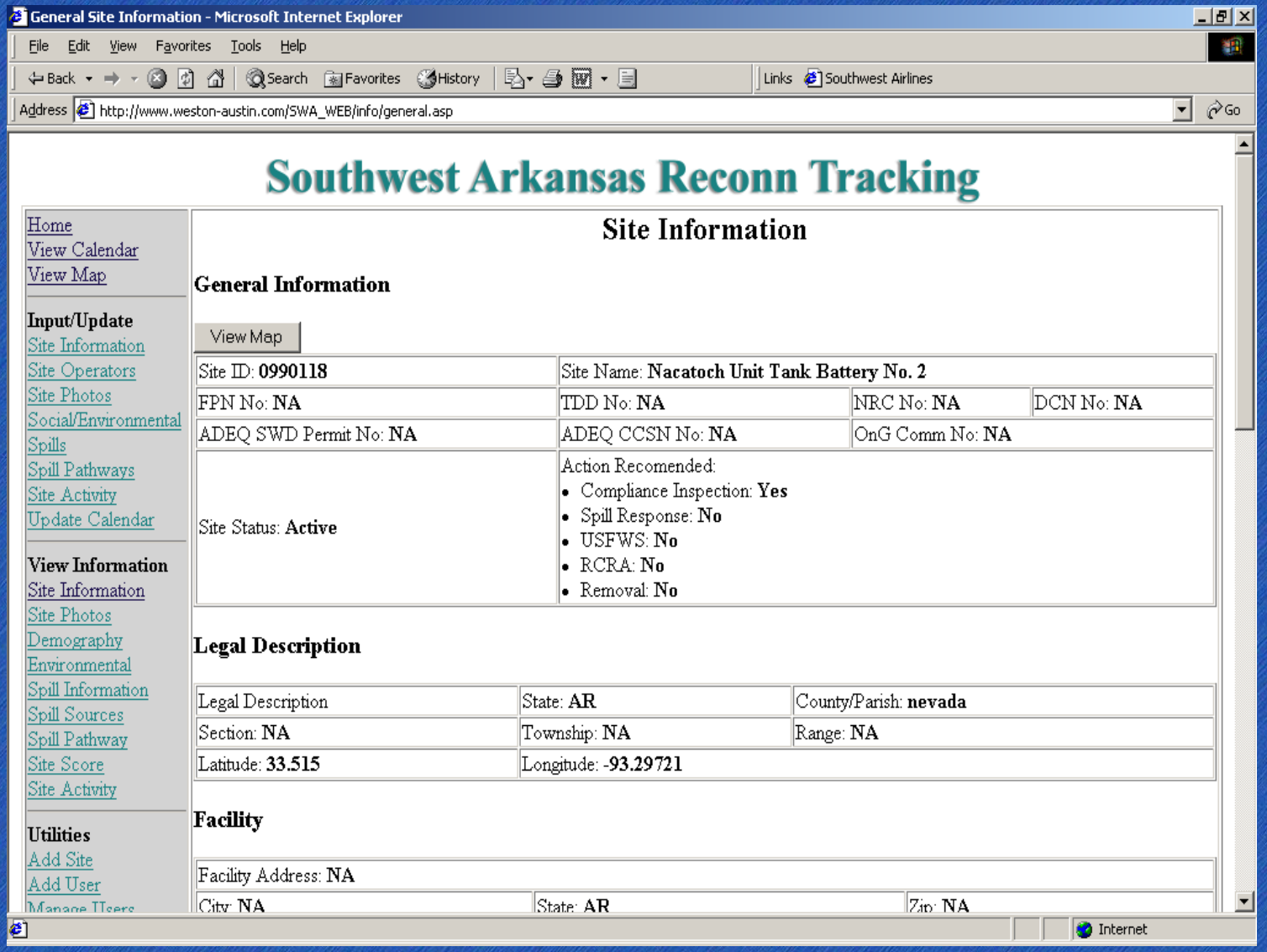
Web Access

- Web-site includes overview of project.
- Calendar of recon's and access to site data if the user is allowed access to that portion.



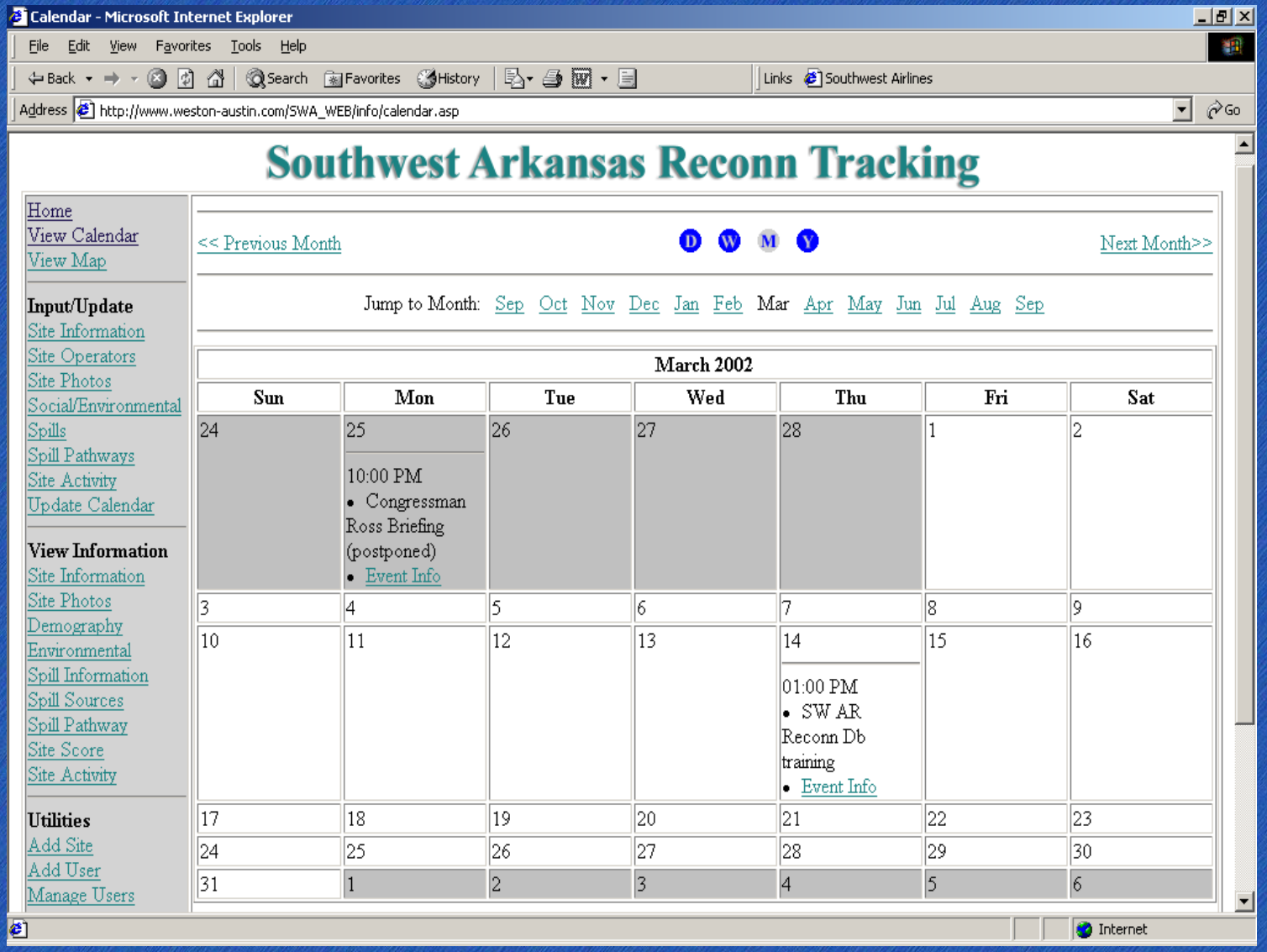
Web-based RDBMS

- Roll-based security insures only specific users can edit data.
- Web-site tracks who has logged on, and what functions were performed



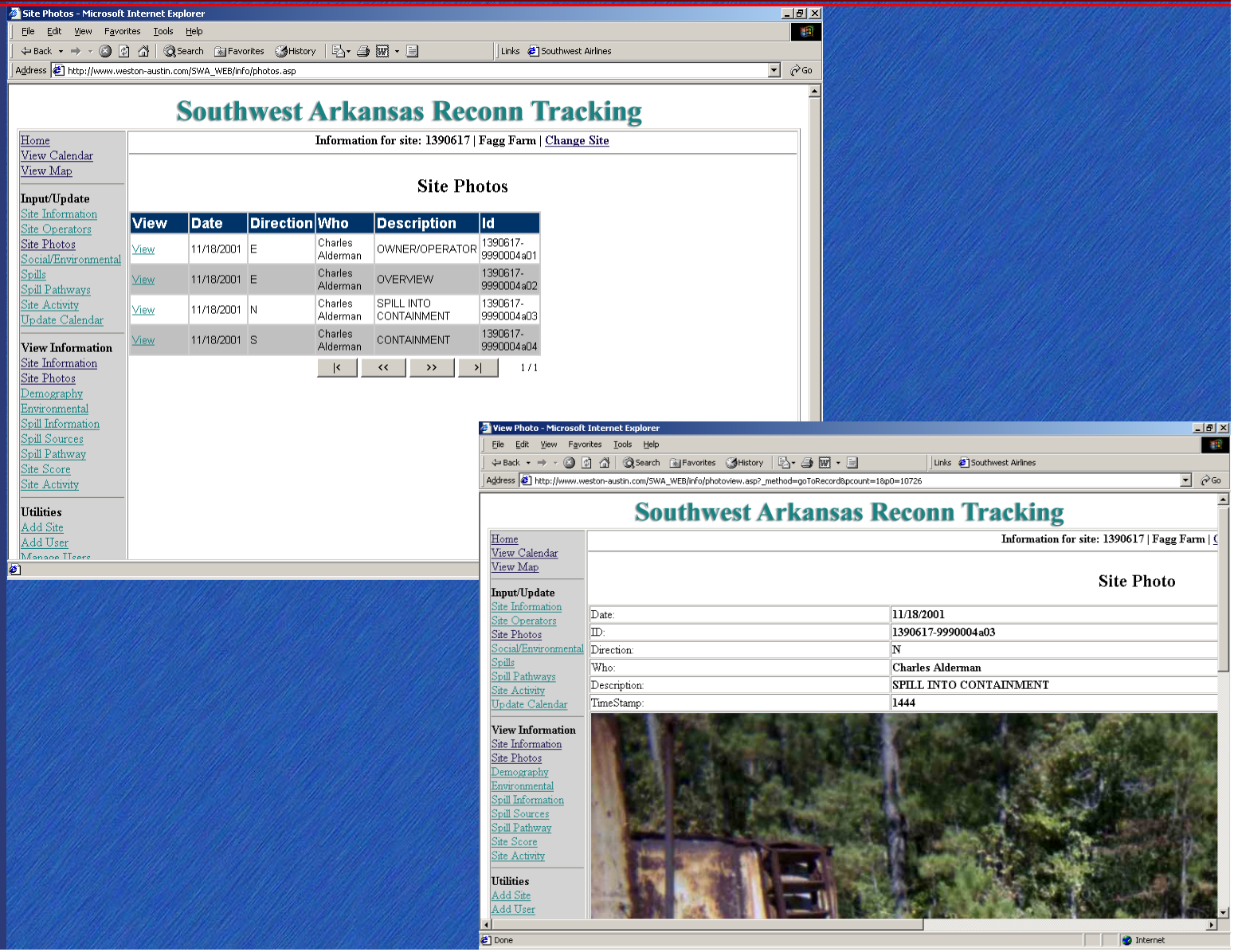
Web-based calendar

- Events are listed by date. With a description.
- Site visits can be linked to site information in the RDBMS



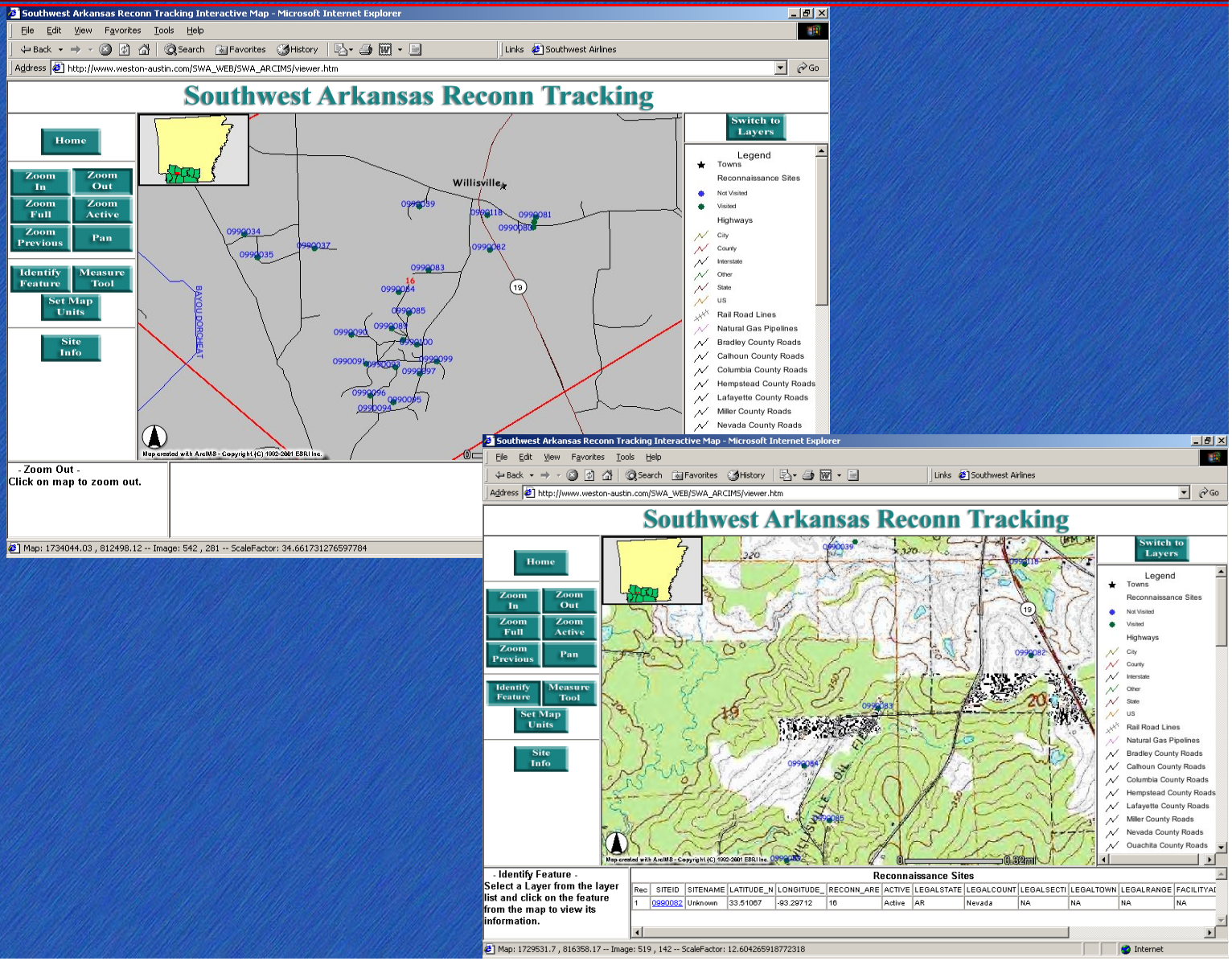
Web-based Photo Management System

- Photos are listed complete with description and ID.
- Includes Aerial Videography Still Shot.



Web-based Interactive Mapping System

- Interactive Mapping system includes GIS layers you can turn on and off
- Site also includes Topos, and site information button

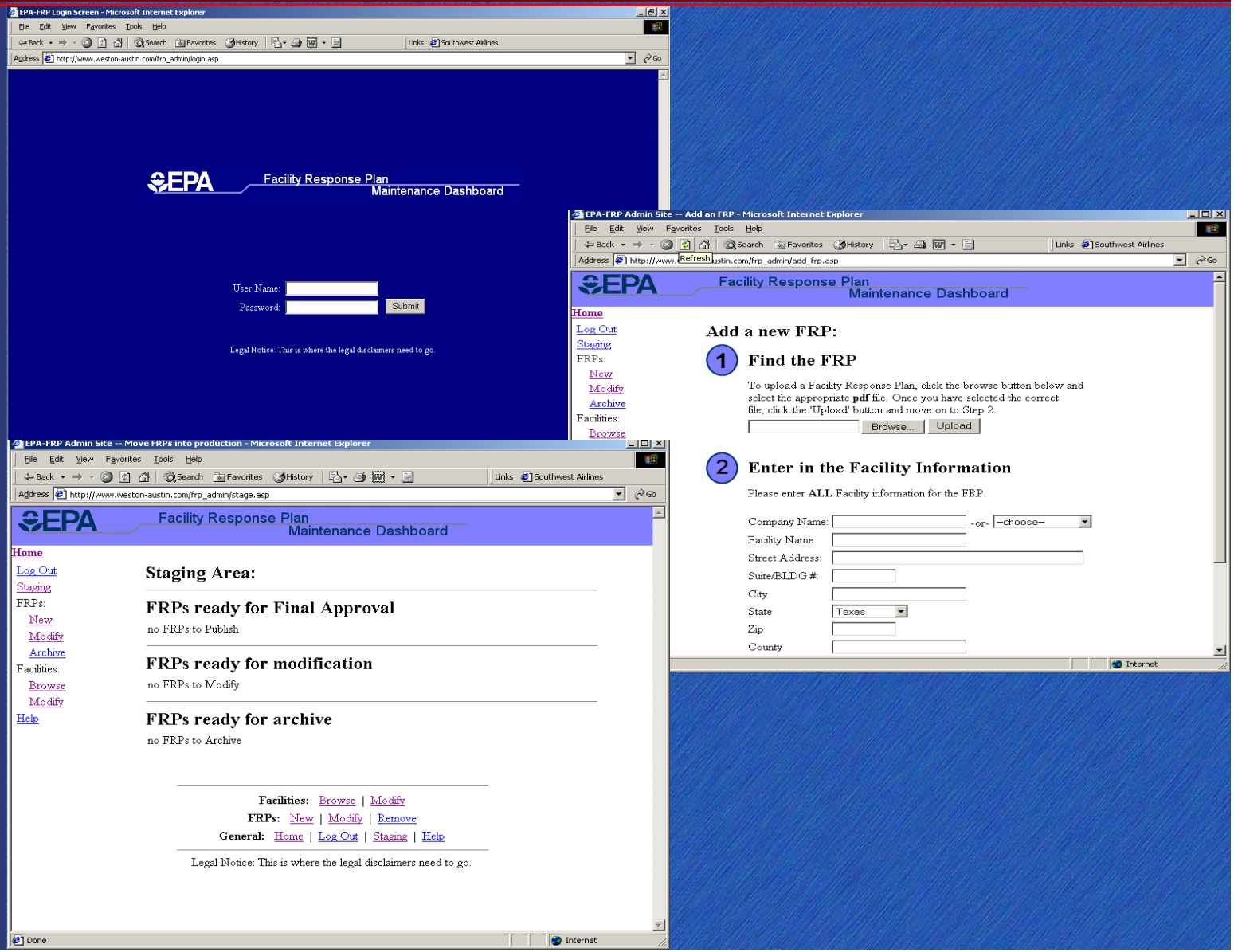


Web-based FRP Management System

- Currently, EPA houses over 1800 Facility Response Plans (FRP's) for qualifying facilities. By law these facilities must send the FRP's to the EPA.
- The Web-based system is designed to allow facilities to submit, update and maintain their FRP's on-line.
- EPA will then review FRP's and publish them, or send them back for further modification.
- System is currently in beta version, and will link to E-Plan hazmat response system

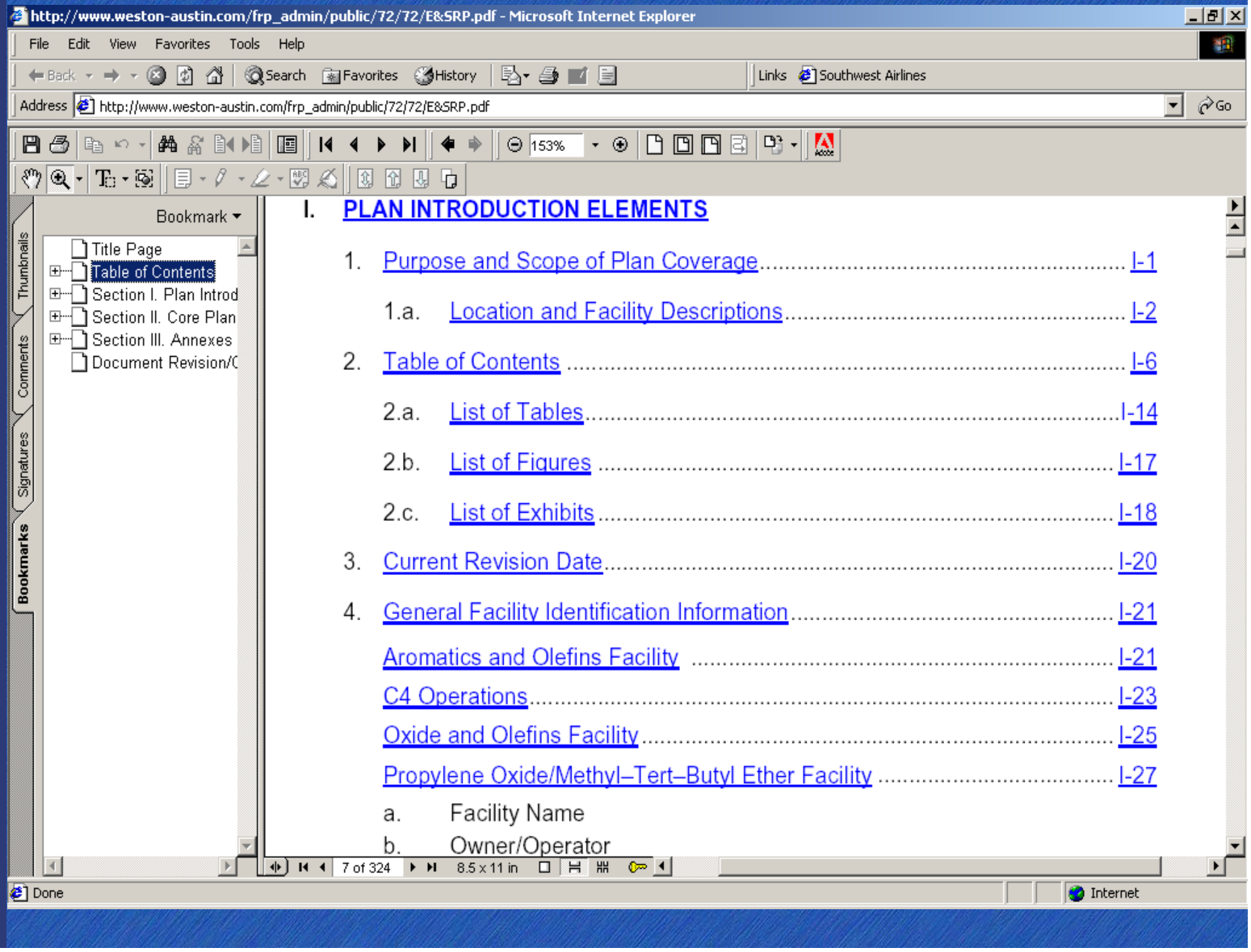
Web-based FRP Management System

- Site is password protected and very secure
- Allows facilities to upload new FRP's & updates
- EPA publishes FRP upon approval



Web-based FRP Management System

- Here is an example of an on-line FRP Table of Contents
- The system links to the table of contents
- User can easily navigate to specific areas

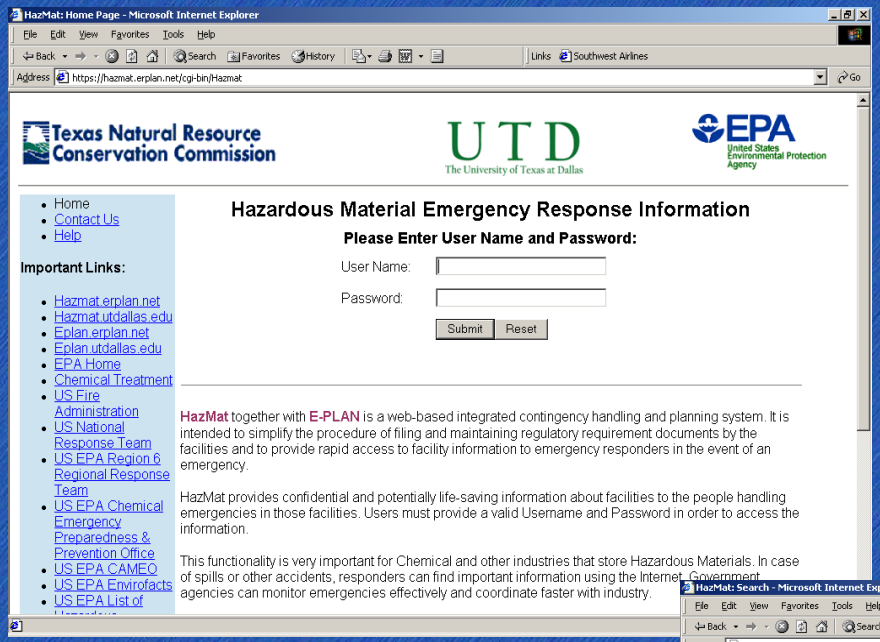


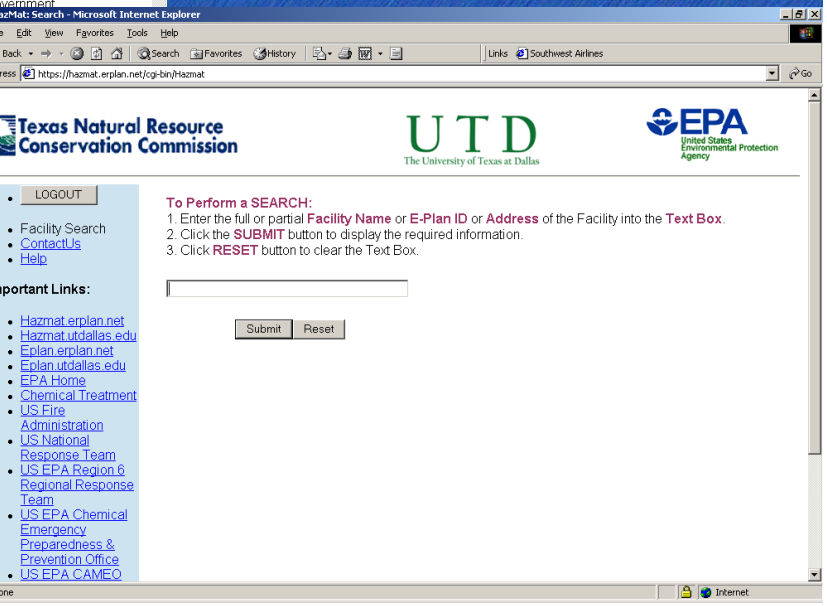
E-plan Hazmat Response Web System

- An EPA-sponsored highly secure web-system designed to make industry hazmat information available immediately online.
- It allows hazmat first responders to quickly access important potentially life saving information.
- System is in beta version right now. EPA working with local LEPC's to test the system.
- System designed to be data repository for all important pieces of information. With a Chemical database, interactive GIS map, links to weather, CAMEO, FRP's and other important information.

E-plan Hazmat Response Web System

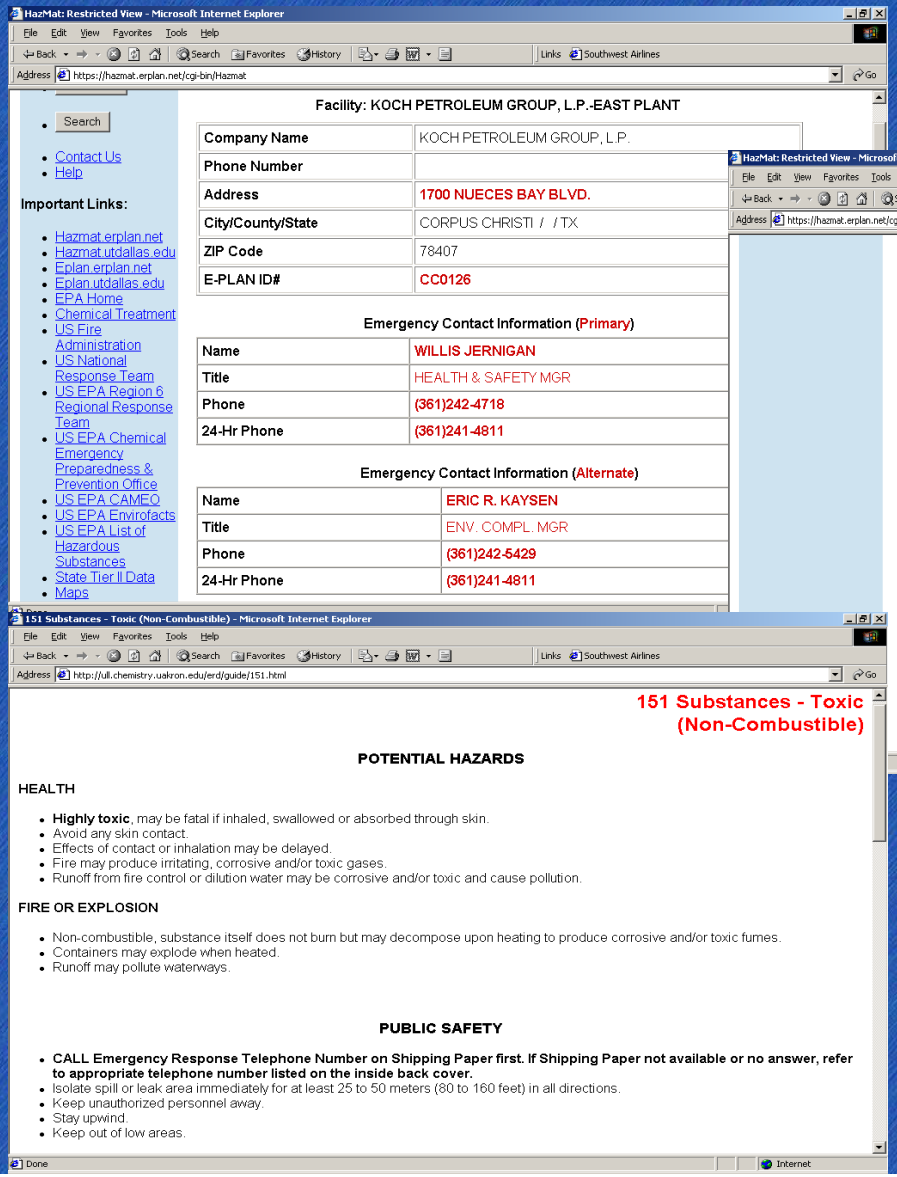
- Roll-Based Security
- Search by multiple identifiers, with partial match capabilities
- Other web-links included on the main page





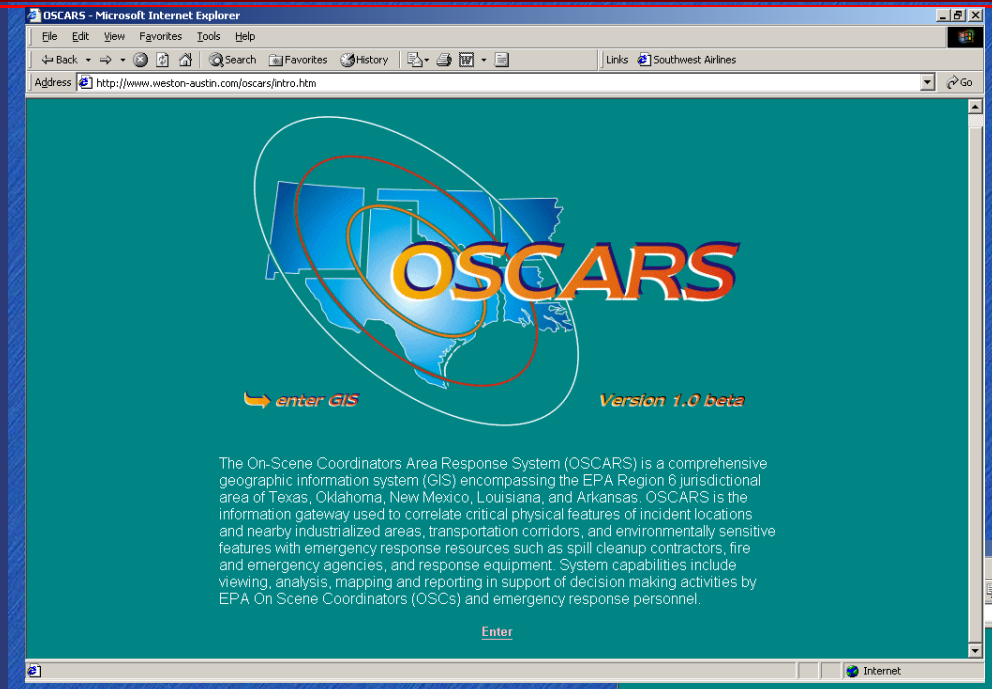
E-plan Hazmat Response Web System

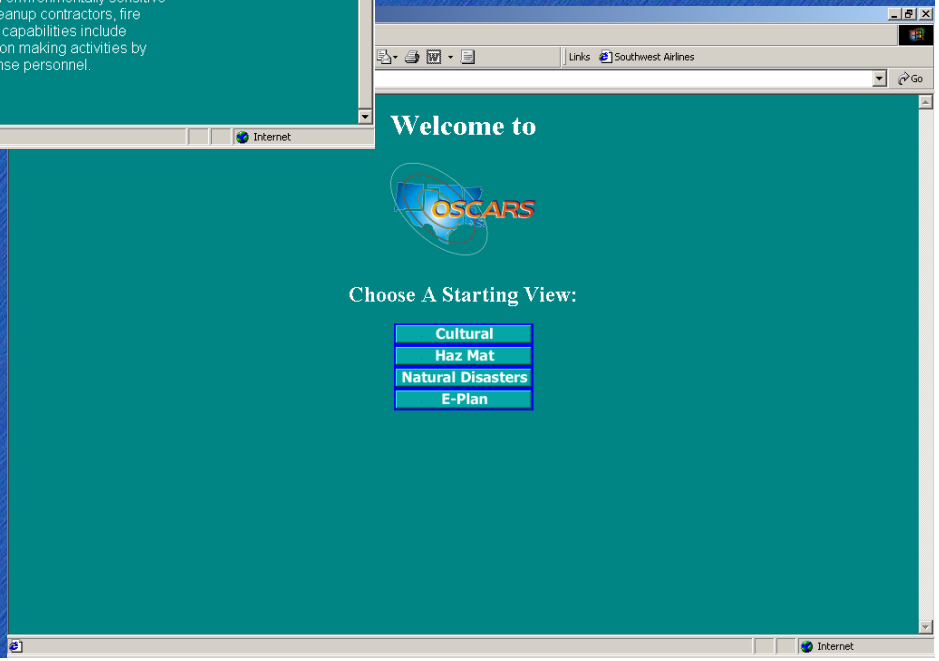
- Facility contact information including Emergency Coordinator
- Chemical storage index linked to ERG, MSDS, and profile information



E-plan Interactive Mapping System

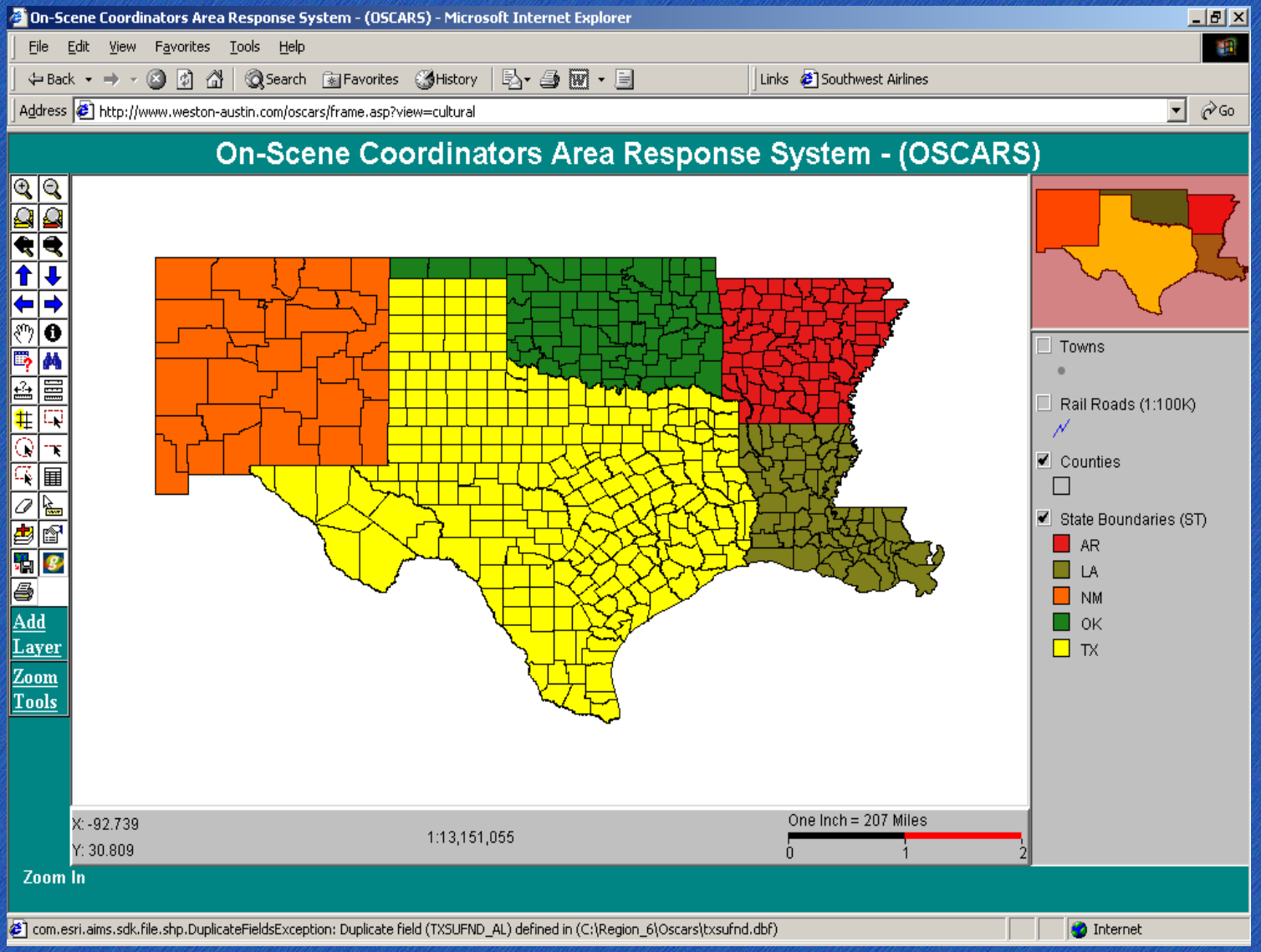
- Site is password protected, with roll based security
- Interactive mapping system allows user to choose starting view





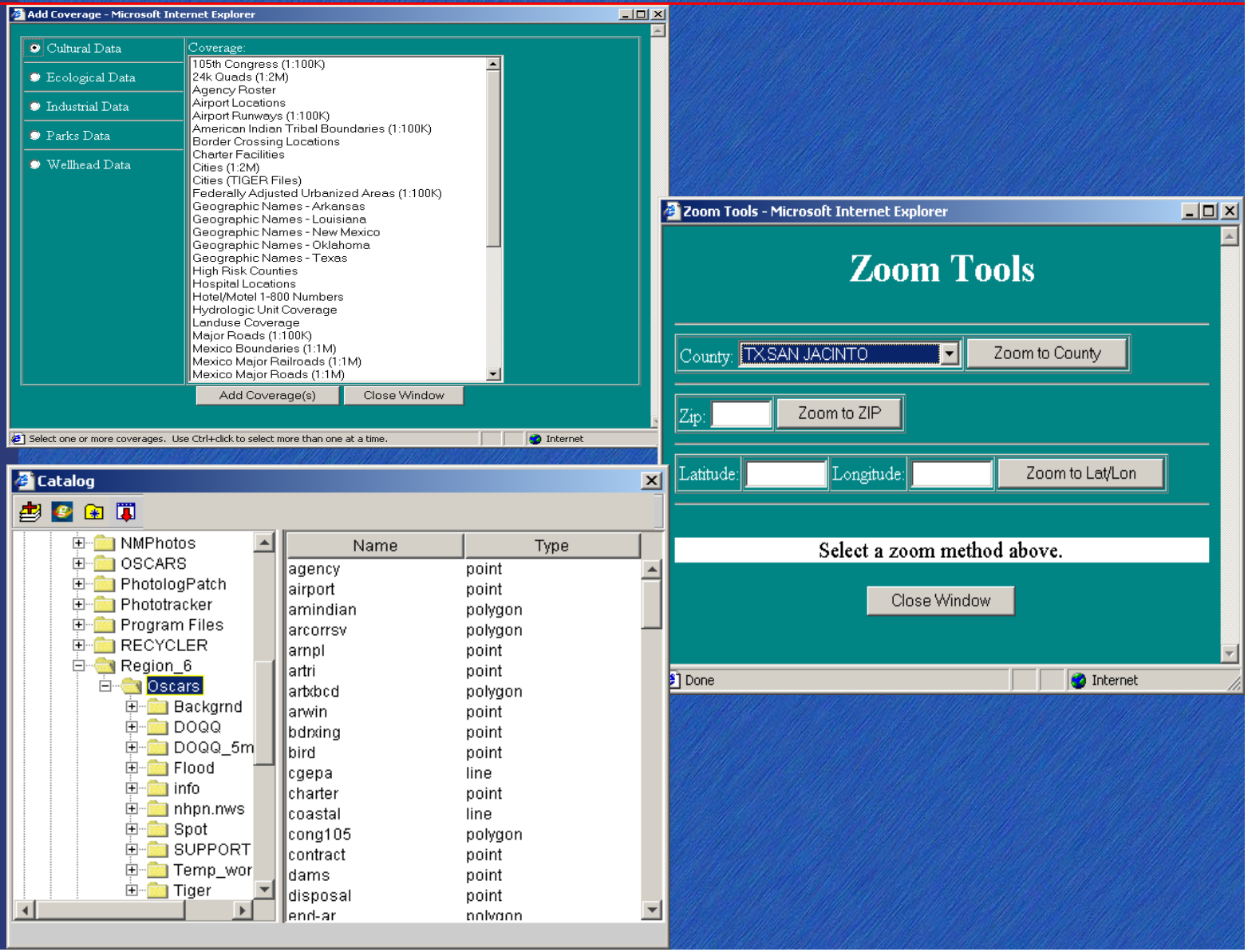
E-plan Interactive Mapping System

- EPA Region 6 wide data sources
- Layers can be added from multiple data sources and removed as necessary
- GIS-based tools built into the site



E-plan Interactive Mapping System

- Add layer dialog allows user to choose data type
- Zoom to county, zip code, and lat. long.
- Add layers from local data sources and other web sources



Lake Oologah Remediation Site

- 45 Square mile area with approximately 10,000 abandoned or little used oil wells
- Wells located adjacent to Lake Oologah Reservoir, major drinking water source for Tulsa, Oklahoma
- Wells need to be located in rough terrain, plugged, and abandoned
- Multiple federal and state agencies involved in clean-up process

Lake Oologah – Technological Solutions

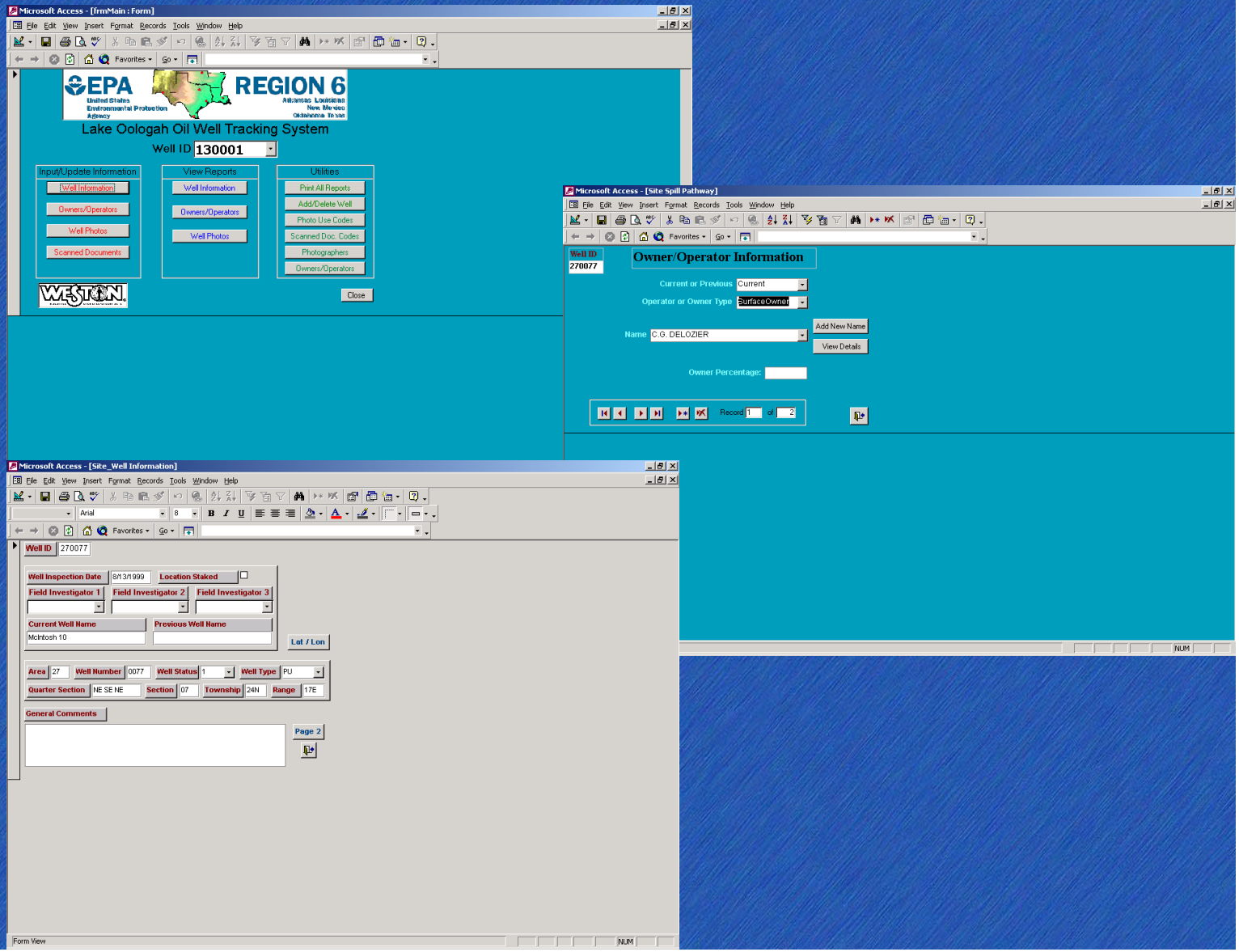
- Site mapped using Aerial Photography and Color Infrared Photos to determine extent of environmental contamination
- RDBMS, GIS, Field Data Collection, GPS, and Web based solution implemented
- RDBMS and GIS connected to show real time status of sites
- Field data collection used to quickly and accurately collect data and synchronize back to RDBMS
- Web site used to communicate between agencies and to show status etc.

Lake Oologah – Technological Solutions

- Wells were located by 2 person recon teams
- Teams were equipped with GPS units and PDA's
- Using specialized PDA application teams located wells and created records for the wells with ID and GPS information
- Upon return to command post information was synchronized with RDBMS and sites were plotted on GIS
- During Plugging and Abandonment the well data was captured using PDA and synchronized back to RDBMS in site command post

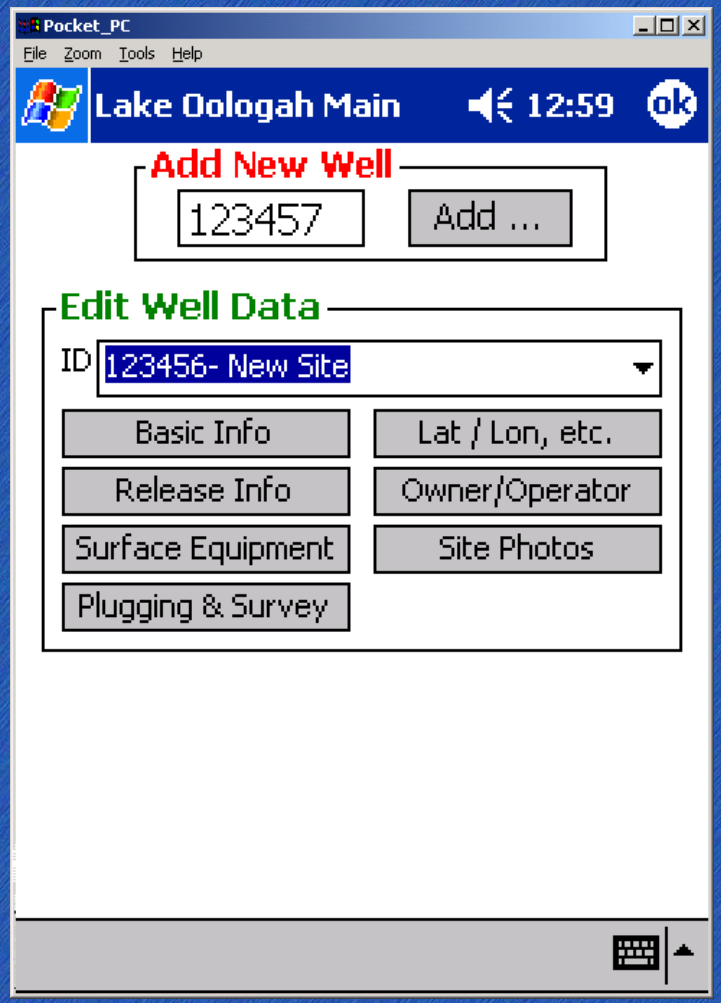
Lake Oologah – Technological Solutions

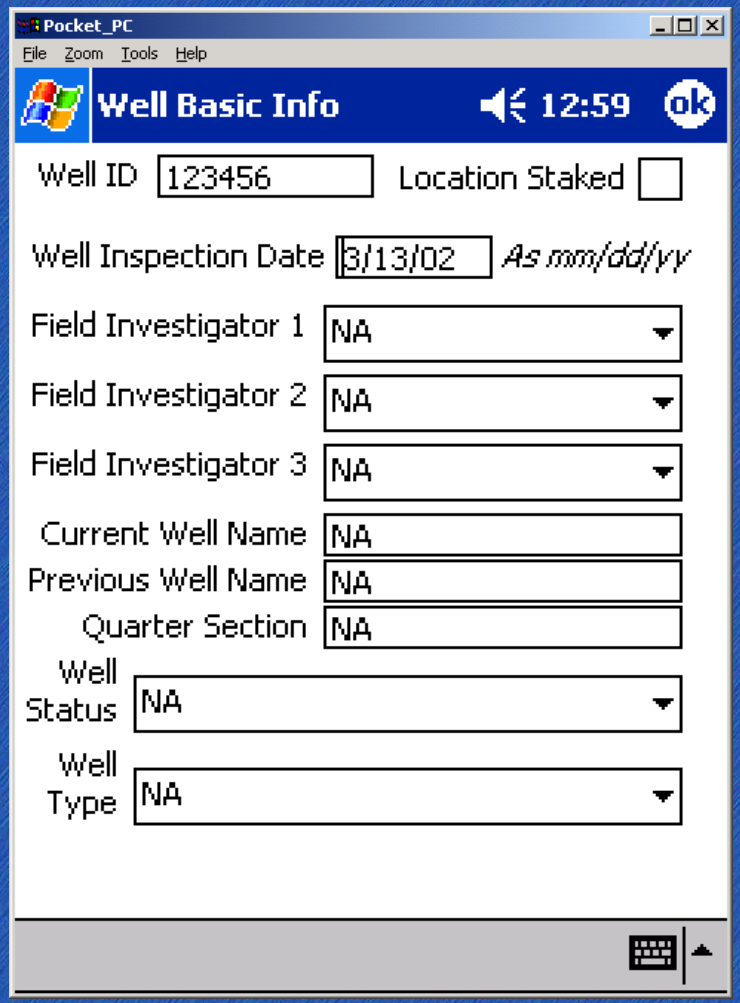
- RDMBS used to maintain site information, and connected to site GIS
- Information maintained on server



Lake Oologah – Technological Solutions

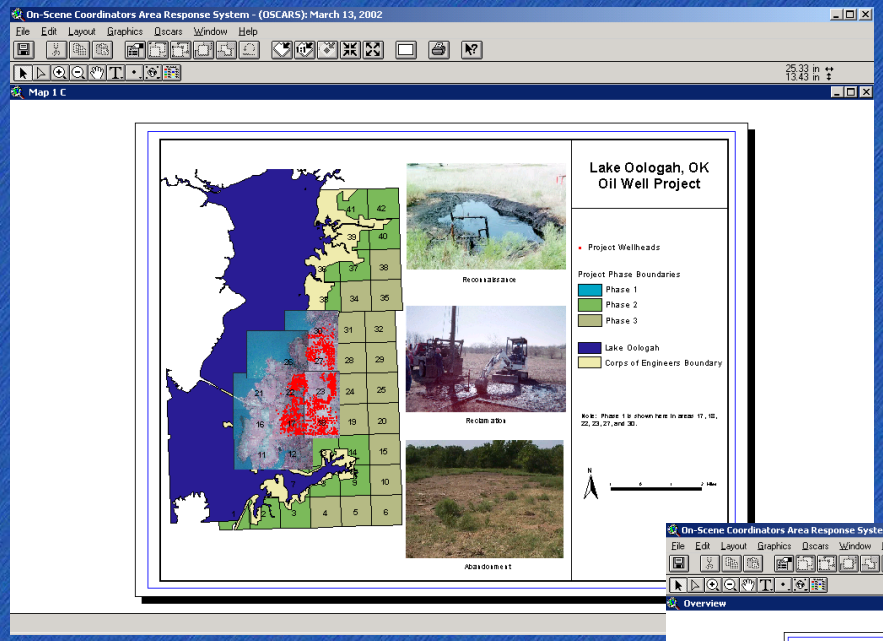
- Special Compaq Ipaq Application created to collect the data
- Application synchronized with RDBMS in command post

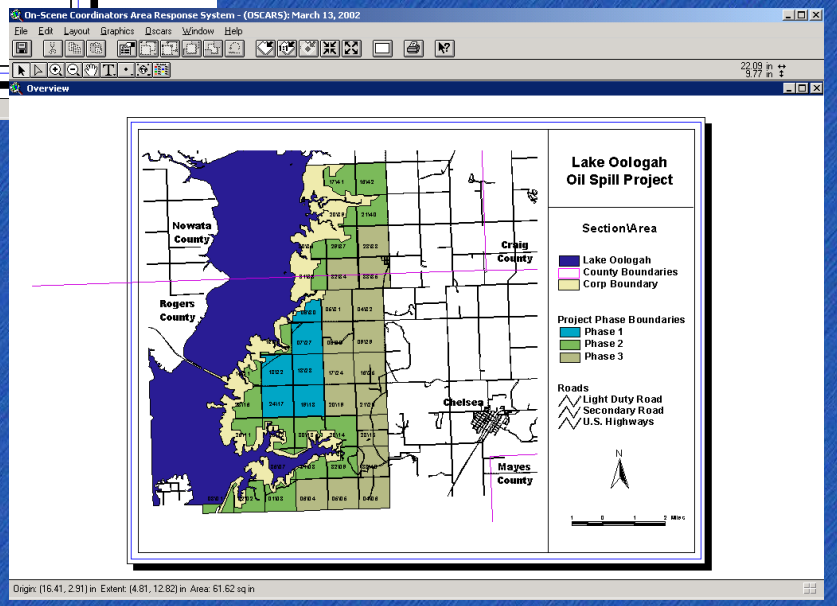




Lake Oologah – Technological Solutions

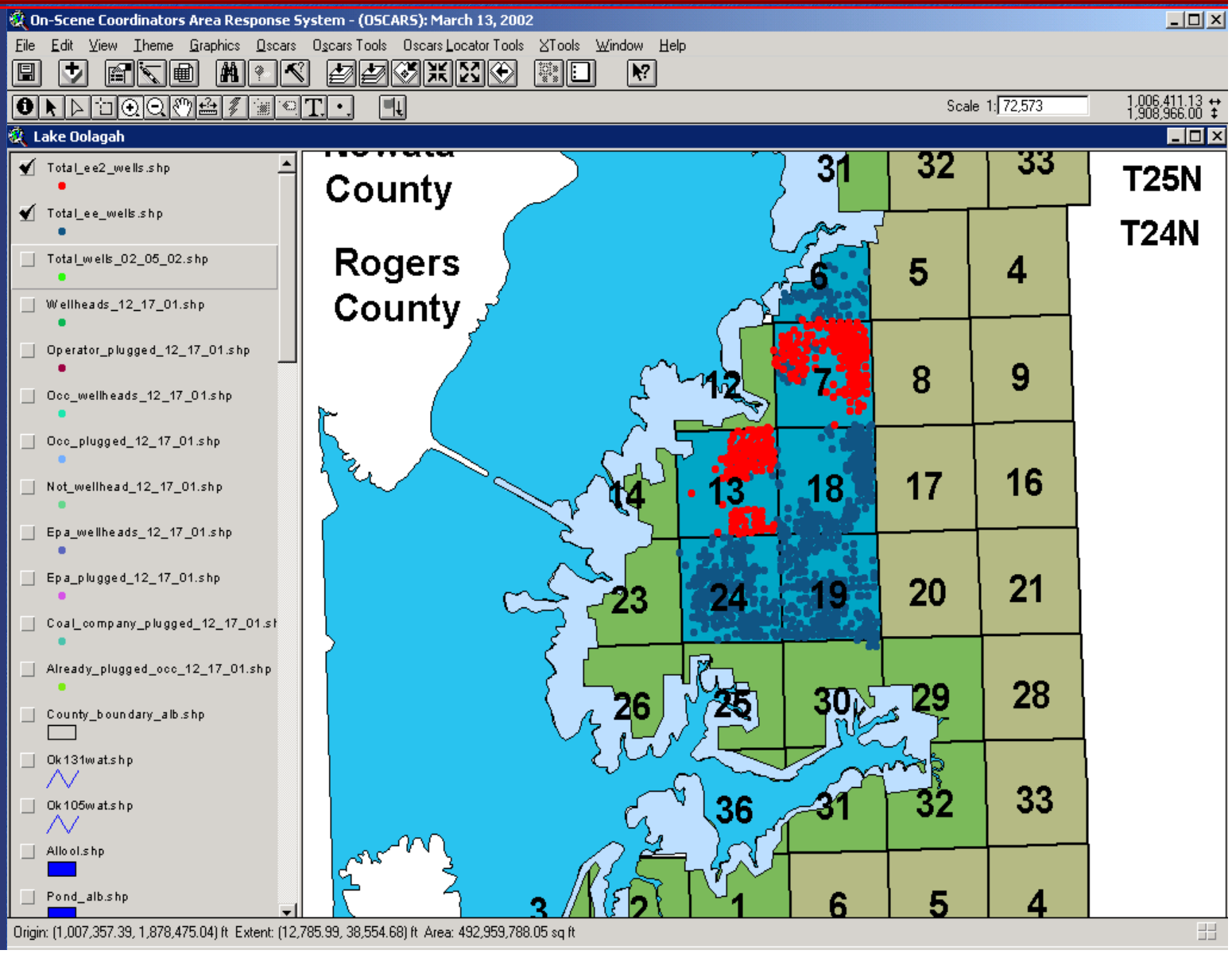
- GIS linked to RDBMS
- Shows well status based on RDBMS
- Ability to make maps on the fly, and make customized maps/reports





Lake Oologah – Technological Solutions

- Map Showing Phase 1 well locations and current status



Presentation Summary

- Integrating Technology:
- Web, RDBMS, GIS, GIS-Web, PDA's, Field Data Collection and GPS