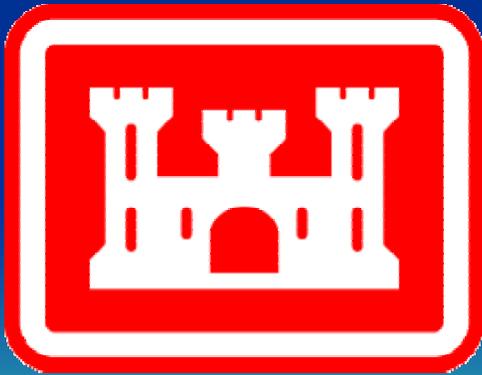


Electronic Data Management for a Sampling and Analysis Task

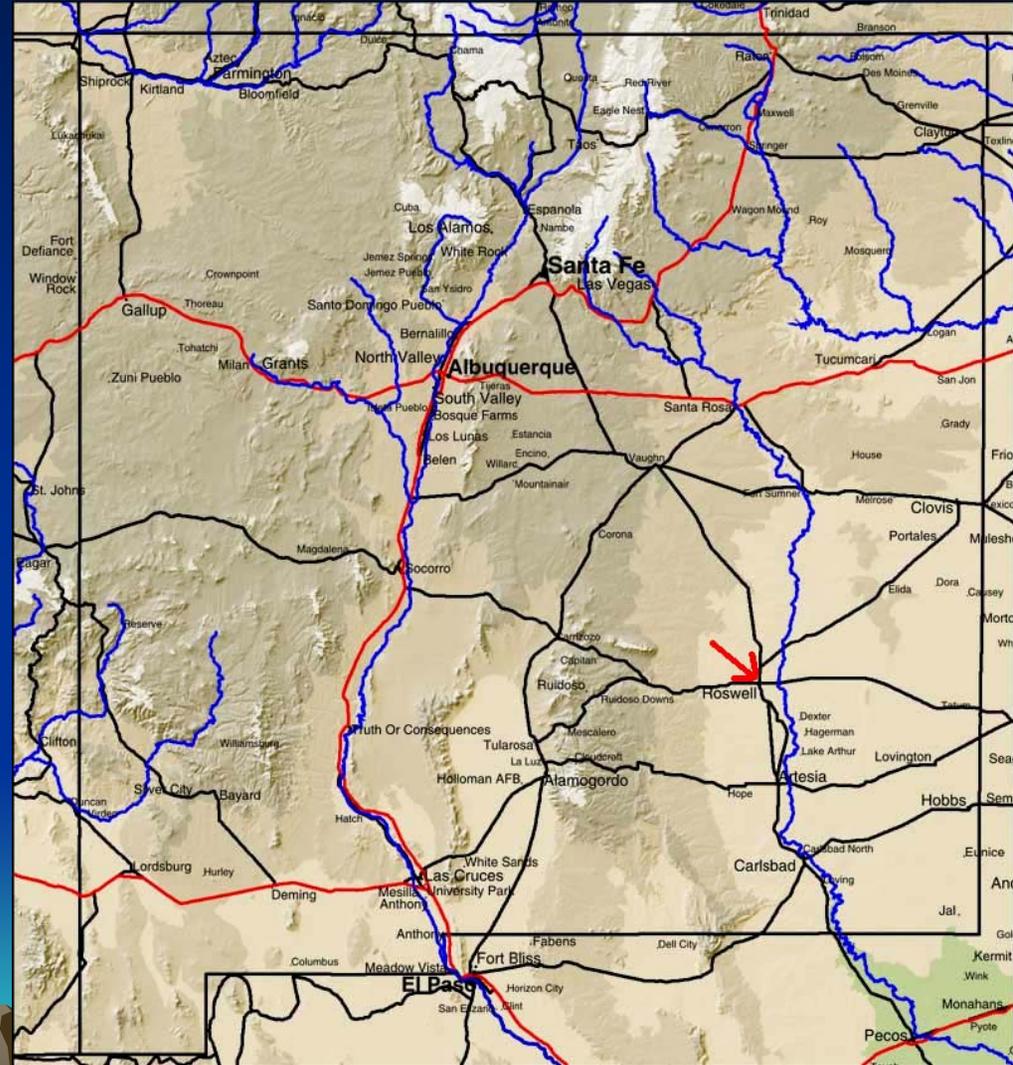
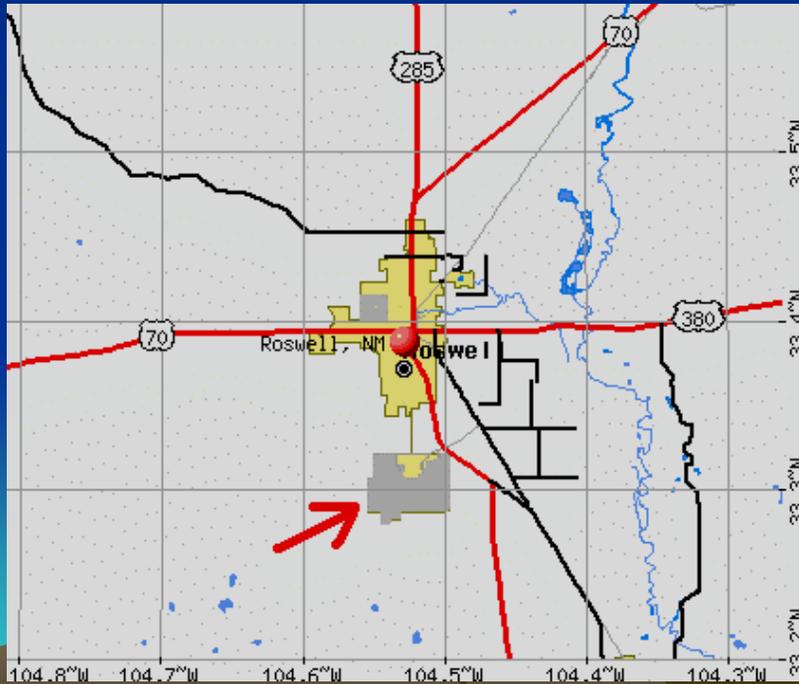
- Basewide Groundwater Monitoring at Former Walker Air Force Base Roswell, New Mexico



Monique Ostermann
David Henry
Brian Jordan



Former Walker Air Force Base Location – Location - Location



Former Walker Air Force Base Basewide Ground Water Monitoring Establish Basewide Baseline

- 65 Monitoring wells installed 1993 to 2003 by USACE & contractors
 - PRP Investigations
 - Phase 1 remedial investigation
 - Phase 2 remedial investigation
 - Other site specific investigations
 - 11 Privately owned, adjacent wells
 - 2 City-owned water-supply wells
 - Wells were 2-, 4-, 6-, and 14-inch diameter
 - Completions in 3 water producing zones
 - Tasks
 - New civil survey of 60 wells
 - Groundwater elevation in all wells
 - Purge and sample 68 wells
 - Field Procedures
 - Subcontract survey, GPS & TDS
 - Water level sweep, electronic tapes
 - Purge & sample; dedicated bailers, portable electric submersible pumps, installed electric submersible pumps
 - Characterize wastewater & dispose
 - Analyze samples, review analytical data, build database, and report
 - Full suite for potential contaminants
 - Water quality parameters
 - Natural attenuation indicators
- 

Data Smorgasbord

- Field and Sample Management
 - Location & elevation
 - Water levels
 - Purge measurements
 - Sample ID, time, date, depth
 - COC, RFA, airbills
- Water quality constituents – 20 wells
 - Major cations & anions
 - Total dissolved solids
 - Hardness
 - Turbidity, pH, temperature, and specific conductance taken in the field
- Potential contaminant analytical data on all 68 wells – full suite
 - VOC, SVOC, Pest/Herb, PCB
 - TAL metals & cyanide
 - Explosives & perchlorate at selected locations
- Natural attenuation indicators – 20 wells
 - Total organic carbon
 - Dissolved gases
 - Dissolved oxygen, ferrous iron, sulfide, redox measured in the field



Former Walker AFB Basewide Groundwater Monitoring

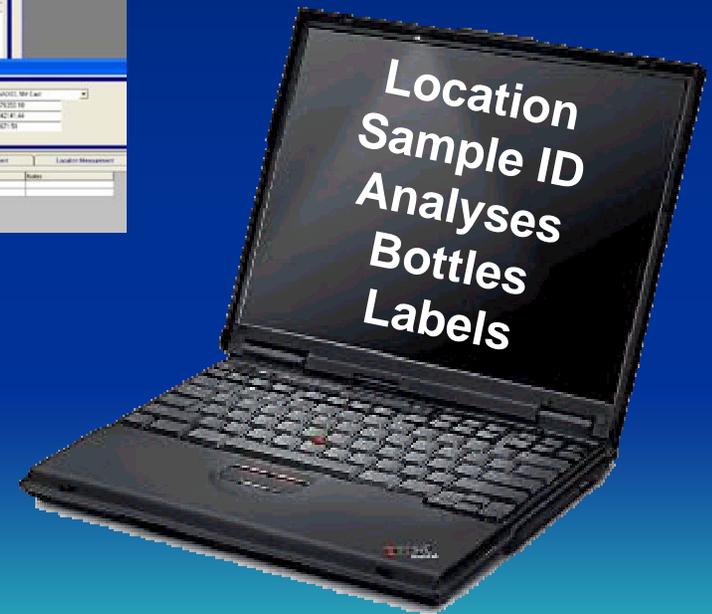
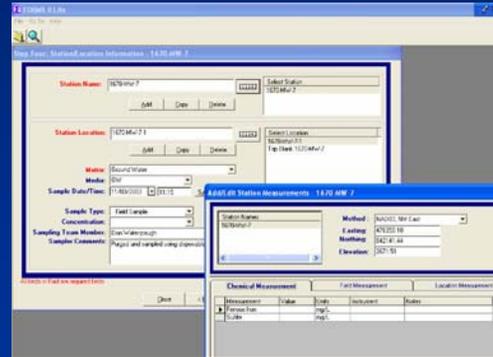
- **Field Support**
 - 2 to 3 sampling crews
 - Sample Mgt, QA, TM
 - 2 Pumps & reels
 - 2 Generators
 - Flow cells, meters, probes
 - 2 Water level tapes
 - Interface probe
 - Job trailer with electrical power and telephone
 - Laptop computers
 - Combo printer / fax / copier
 - 2-way radios & cell phones
 - Commercial mini-storage
 - 2 pickups, cargo van
 - **Contract Lab Requirements**
 - Bottles & shipping materials
 - Level 4 full data packages for all
 - Reports in paper and PDF on CD
 - Electronic data deliverables for data review, by e-mail and on CD
 - Routine turnaround time
 - **Performance Summary**
 - Field sampling took 13 days
 - Over 90 sample coolers shipped
 - Over 21,000 lab results generated in 26 sample delivery groups
 - Data review completed in Jan
 - Draft report delivered in Feb
 - Final report delivered in April
 - 5 months from mob to complete
- 

Electronic Data Management Tools

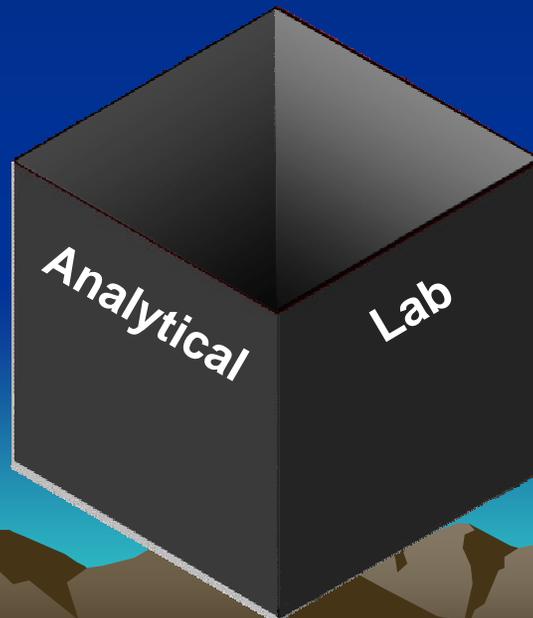
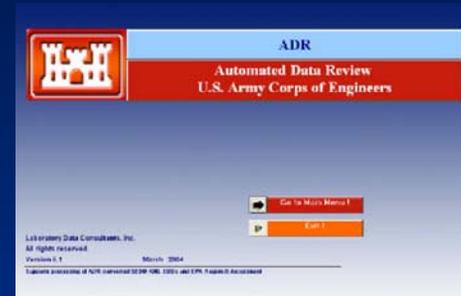
- Software tools were office standards or applications specified by USACE
 - Pre-mob task set-up from FSP / QAPP
 - Capture survey location, field data, and Chain-of-Custody documentation
 - Electronic data deliverable receipt, checking, and analytical data review
 - Database loading, custom queries for export, table generation, and QCSR
 - All lab reports, field documentation, data validation libraries and reports, QCSR, project report saved and delivered in PDF



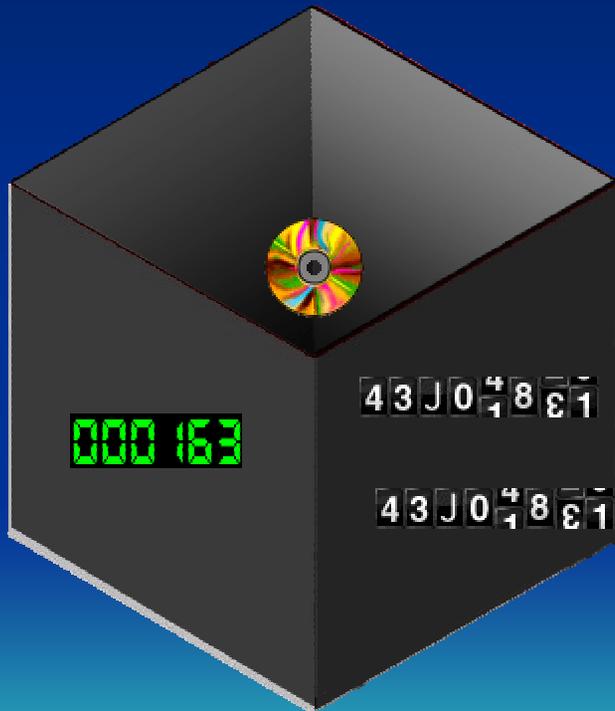
Pre-mob Task Set-up from FSP / QAPP



Pre-mob Task Set-up from FSP / QAPP



Laboratory Generated Electronic Data Deliverable



Electronic Data Management

- After EDD and PDF receipt, all field and laboratory data had been electronically captured
- Process EDD and review analytical data
 - Check EDD compliance with specifications
 - Correct or comment to any EDD non-compliant entries
 - Perform project specific data review
 - Assign, review, and accept data qualifiers
 - Print data review reports in organized PDF



Electronic Data Management

- Load the database – Field data
- Export data from Forms 2 Lite to comma delimited text files
 - Sampling location names and survey coordinates
 - Sample dates, times, and Chain-of-Custody information
 - Field measurements (water quality, field chemistry, water levels)
- Load comma delimited files into spreadsheets
- Copy, cut & paste data to database import spreadsheet format and upload



Electronic Data Management



- Load the database – Laboratory data
- Upload reviewed analytical data and data qualifiers from saved automated data review files
- Reconcile field and lab data for key fields, syntax, data format, etc.
- Run QCSR and print in PDF
- Custom query and save data tables to spreadsheet or word processing
- Export database in text flat file for GIS import

Electronic Data Management

Bumps in the Road

- Facilities and Equipment
 - Analog telephone line in temporary office facilities
 - Laptop computers are not field rugged and difficult to view
- Data Formats
 - Merging field and laboratory data from multiple input points to final database
 - Inconsistencies between initial entries and final database requirements, text, values, dates, and times
 - Multiple step electronic transfers can change format, round, and truncate values
- Training on the Job
 - Not adhering to the EDD specifications
 - Not understanding database relationships and key fields



Electronic Data Management Opportunities for Improvement

Electronic field data entry into spreadsheets with field-rugged PDA, print and sign for paper record

Upload purge measurements directly to spreadsheets on laptop or PDA

Ad hoc wireless data network

Will e-mail Chain-of-Custody Records ahead of samples either in PDF or XML format

If using paper field forms we'll key field data directly into EDMS and not transfer from F2L

Parser routine to export F2L sample data directly into EDMS upload formats

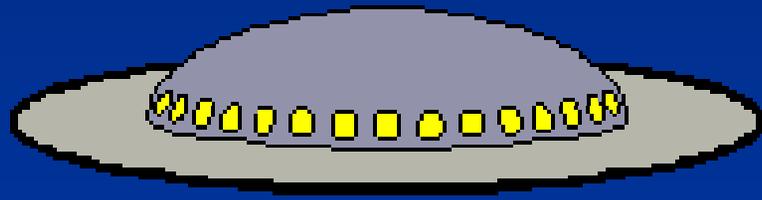
File and maintain records in PDF on CD or DVD



Former Walker AFB Basewide Groundwater Monitoring Electronic Data Management

- Used many, but not all, of the tools available
- Efficiency in handling, reviewing, and reporting data was greatly increased
- Automated data review allowed us to look at overall analytical performance and spot trends or problem areas rapidly
- Data entry errors or data format inconsistencies were quickly identified and corrected
- For future work, site and well location data already captured
- Overall, for the amount of data we handled, efficiency and quality increased managing data electronically
- We are still maintaining paper records and are required by contract





**THE
END**

