Brian W. Zelt

COMPUTER APPLICATIONS & PROGRAMMING

Alces Report Wizard, Alces Group — **Canada**

Excel VBA/Word VBA programming for automatic report generation from Alces output spreadsheets. Program creates a report and appendices based upon user configurable report skeleton for tables, graphics and text.

ERCBRISK, ERCB — **Canada**

Air quality model for risk calculations for set-back review for pipelines and sour gas drilling planning tool. Risk calculations include spatial programming and surface calculations variable meteorology and plume dispersion impacting variable population density as a function of distance from well/pipeline. (VB-Excel/Fortran)

Broadview Homes — **Alberta, Canada**

Development of a web based project management database and application. Online project management software application for Broadview Homes to track housing construction development, change orders, and warranty work. Developed using MYSQL, Java and PHP active pages. In associate with Schulz Asset Management – Advanced Media.

Training Presentations, Alliance — **Alberta, Canada**

Development of four guided environmental training presentations. Animated and narrated training presentations were created using Microsoft Powerpoint, packages included: Waste Management, Spills, Vegetation and EMS.

ERCBH2S SLAB (Dense Gas) Model Modification, EUB — **Alberta, Canada**

Thermodynamic and physical modifications developed by Michael Zelensky were programmed within the USEPA SLAB program. These program modifications will be released as the hazard and evacuation zone planning tool for the Alberta Energy and Utilities Board (EUB) for planning hydrogen sulphide pipelines and wells in Alberta. (Fortran, VB-Excel,DOS-batch).

ERCBflare & ERCBIncin, EUB — **Alberta, Canada**

MS Excel spreadsheet tools developed using M.Zelensky's combustion and emissions calculations. These tools provide an energy balance approach for specifying the source parameters for air quality modelling as well as performing screening level air quality predictions using SCREEN. (Fortran,VB-Excel).

Project Planner Database and Tracking System, TeraEnv — **Alberta, Canada**

A database was created for internal project tracking. The database was developed for a multi-user environment to track progress and issue. Reports were created for weekly and monthly planning. (VB-Access)

Inspector Reporting System, Alliance — **USA, Canada**

Two database systems were created for Alliance Pipeline Project (Canada) and Alliance Pipeline L.P. (U.S.A) to enable environmental inspectors to electronically complete inspection reports on field laptop computers and submit their reports to centrally located master databases. These database systems allow completion of reporting forms that meet the requirements for Canadian and U.S. regulatory agencies (NEB and U.S. EPA). Reporting requirements include: general reporting, contact meeting notes, spills, water-crossings, non-compliance events and follow-up inspection reports. (VB-Access)

Commitment Tracking Database, Alliance — **Canada**

The database catalogues and tracks progress on fulfilment of environmental commitments made by Alliance during hearings and public meetings, and of conditions contained in the project approval. Captured in the database are: the exact text of commitment, the origin of the commitment text, progress to fulfilment, and information about each commitment. Specific data collected on each commitment includes: type, topic, activities it relates to, locations it affects and completion progress. (VB-Access)

Decision Support Software, INGAA — **Alberta, Canada**

A user-friendly, risk based, decision support Windows® program (*CROSSING*) was developed. The program accepts readily available stream and biological information then calculates the impacts of stream crossing sediment emissions. The dispersion model and graphics (plotting and contouring) were refined from original code. (C++ Windows)

Project Management Software — **Alberta, Canada**

A user-friendly project management database was programmed in Excel—Visual Basic to track project costs and personnel hours charged on a weekly basis and compare the charged hours against budgeted hours. (VB Excel)

Project Management Software — **Alberta, Canada**

A probabilistic project management schedule was prepared in Excel to estimate likelihood of project permit acquisition by company target dates. (@Risk Excel)

Spill Model Development — **Alberta, Canada**

Using the Northern River Basin Study longitudinal and transverse dispersion study results, a Windows-based user-friendly spill model was developed to predict the time of arrival and downstream water quality concentrations as a result of instantaneous spills anywhere in the Athabasca River basin. The C++ program allows the user to point and click the location of the spill and view the spill-induced water concentrations at user-specified downstream locations. The program displays a list of contacts and phone numbers of downstream users affected by the spill. (C++ Windows)

Northumberland Strait Crossing — **Prince Edward Island, Canada**

The analysis of the ice bearing resistance of the piers for the Northumberland Strait Crossing bridge was programmed probabilistically using the Zelt Probabilistic Risk Assessment Framework. The analysis increased the efficiency of the calculations and achieved a factor of 20 increase in speed. (C++ DOS)

Model Pre/Post-Processor in Windows® — **Northern Alberta, Canada**

An MS-Windows program was developed to be a user-friendly interface for the U.S. EPA water quality modelling program WASP. WASP is a

large FORTRAN-77 code and the operating configuration required 8 MB of RAM (under a DOS extender). The Windows interface program allowed the user to modify selected parameters of preconfigured WASP input files. The program ran the WASP model in a DOS window then returned to the Windows environment to postprocess the output files. Various XY-plots and contour plots were included in the postprocessor as well as observed data import and export of plotted data. (C++ Windows)

Probabilistic Risk Assessment Framework — **Northern Alberta, Canada**

Developed an object-oriented framework for probabilistic calculations. The library was incorporated into several DOS programs to analyze ecological and human health performance assessment of the Suncor/Syncrude reclamation scenarios. The framework allowed a model to be coded with standard C variables and then converted to a Monte Carlo (probabilistic) analysis with very few code changes. (C++)

User-Interface Development — **Ontario, Canada**

Developed a user interface in the UNIX MOTIF graphical window interface for the new UNIX platform version of "Imagenation" image/document view/edit software system for Spicer Corp. (Motif)

Occupational Health and Safety & Alberta Public Safety Service Grants — **Edmonton, Alberta**

Model and theory development and programming of two state of the art air dispersion models (*SHELTER* and *EXPOSURE*) which run on an IBM PC computer in a user-friendly way. The project included the development of a fast DOS pop-up window environment operating in text and graphics modes, development of graphical plotting routines and development of the algorithms implementing the dispersion models. The models predict concentrations and concentration fluctuation levels downwind of sources and predict indoor and outdoor, toxicity and mortality estimates based on the gas lethality. The computer programs are used by several Alberta and Ontario government agencies and by several agencies in the U.S. and England. (C-DOS)

Robotics Control Theory Program — **Edmonton, Alberta**

Developed a three-dimensional flexible linkage robot simulation program to investigate various PID and high-level control strategies. The program was developed for the DOS and UNIX computer platforms. In the DOS environment the program both processed the control strategies and animated the movement of the robot's arms in three dimensions. (C/C++)

Scientific Plotting — **Edmonton, Alberta**

Developed a scientific plotting and data analysis program in C and assembler to operate in MSDOS. Scientific time series analysis, digital filtering, Fourier transforms and data series mathematics operations were included. The program included a messaging system to control pop-up windows and menus in text and graphics modes. Printer output for dot matrix and laser jet printers were included. (C/C++)