



SPE 95164-PP

Resolving the Nightmare of Performance Reporting and Portfolio Management - A Web Based Approach

Brad Nickle, Dr. Richard Strickland SPE, Dwayne Purvis SPE / The Strickland Group

Copyright 2005, Society of Petroleum Engineers Inc.

This paper was prepared for presentation at the 2005 SPE Hydrocarbon Economics and Evaluation Symposium held in Dallas, TX, U.S.A., 3 – 5 April 2005.

This paper was selected for presentation by an SPE Program Committee following review of information contained in a proposal submitted by the author(s). Contents of the paper, as presented, have not been reviewed by the Society of Petroleum Engineers and are subject to correction by the author(s). The material, as presented, does not necessarily reflect any position of the Society of Petroleum Engineers, its officers, or members. Papers presented at SPE meetings are subject to publication review by Editorial Committees of the Society of Petroleum Engineers. Electronic reproduction, distribution, or storage of any part of this paper for commercial purposes without the written consent of the Society of Petroleum Engineers is prohibited. Permission to reproduce in print is restricted to a proposal of not more than 300 words; illustrations may not be copied. The proposal must contain conspicuous acknowledgment of where and by whom the paper was presented. Write Librarian, SPE, P.O. Box 833836, Richardson, TX 75083-3836, U.S.A., fax 01-972-952-9435.

Abstract

Many papers have been written concerning the energy industry's need to become more efficient in its methodologies and operations. The shrinking qualified workforce and global economic factors are placing further pressures on the energy sector to streamline processes. This requirement extends itself to all phases of the energy industry, especially with multi-disciplinary multi-organizational teams.¹⁻⁵

For the past 5 years a major private equity player has successfully exploited the digital oil field to streamline its asset management processes. This company manages its 2.3 billion dollar oil and gas portfolio with a staff of 5 professionals by utilizing a web-based portfolio management tool. This same staff of 5 annually approves over \$100 million in AFE's.

Since inception this web-based application has been successfully deployed to manage 36 different partnerships across the United States. This system has benefited by the proactive input of over 300 industry professionals throughout the application development and deployment cycles. The software currently consists of over 60 different analytical tools to analyze the performance of a portfolio.

This paper examines the use of web based technologies to build a portfolio management system. There are many pitfalls and challenges to overcome to ensure the success of an application designed to monitor performance and measure value. From specifications through rollout to E & P companies aspects of design and deployment are thoroughly explored.

Introduction

Professionals in the oil and gas industry spend inordinate amounts of time and effort to gather, organize, format, and synthesize data into useful reports for subsequent analysis. Precious efforts, which should be directed towards proactive actions to improve value, are often diverted to lesser-valued services. A web-based portfolio management tool can assist E&P companies in adding value to a project while at the same time keeping investors, partners or managers informed as to the performance of a project or an entire portfolio.

In most circumstances, the operator is the only party in possession of data required to understand and evaluate a project. A mandate or requirement of the operator to provide the necessary production and financial data to investors/lenders can be counter productive to the overall objectives of the project. The operator's primary focus should be on higher valued services (effective operations and adding value to a project) not on data assimilation. Constraining an operator with excessive reporting requirements is a good way to ensure that project performance objectives are missed.

Conflicting requirements of timely analysis versus a focus on higher valued services makes the prospect of portfolio management rather bleak. Many have attempted to solve this problem with excessive man power and herculean efforts. Others simply settle for analysis which is old and outdated. Traditional efforts usually involve attempts to utilize spreadsheets to communicate and track productivity. However, the limitation of spreadsheet technology to track and manage a portfolio becomes evident once an organization begins to handle multiple projects.

Although timely portfolio analysis has been difficult in the past, new technologies associated with the digital oil field are propelling change in the industry. Web technologies are now being harnessed in such a way that all interested parties can be informed on a timely basis concerning project performance. These same technologies allow E&P companies and portfolio managers to focus efforts on the higher valued services leading towards activities that increase value.^{6,7}

The fundamental requirements for such a system were defined by a financial institution who wanted to implement a portfolio management system across their oil and gas portfolio. In order to meet corporate objectives the following functional requirements were defined for the project:

- System must be implemented by an E&P company with little cost and almost no effort
- Allow all parties to utilize the same tools which operate on a single project or across the entire portfolio
- Synergistically communicate and evaluate performance according to the goals and objective of the project
- Be intuitive and easy to use by all parties
- Secure data from unauthorized access

Web-based Approach

It was determined that a web-based application would be the most desirable approach since the project was dealing with multiple organizations spread throughout the United States. Web-based applications allow continuous upgrades and improvements to the system without placing any burden on the user. Software modifications are made to the web server and improvements are automatically available to the user whenever a web page is delivered to their personal computer. With this approach, 99% of the headaches of application deployment are resolved.

An additional advantage to a web-based application is that the system can be built around a centralized repository that can be accessed from any place in the world, given proper security. All the data for the web application can be stored in a central repository allowing authorized users access to the data from any location having internet capabilities. With multi-disciplinary teams possibly working for different organizations, this approach allows all users to have access to the same data as well as the same suite of application tools. This eliminates the evitable question, “do I have the correct copy of the report?” or “do I have the most current version of the performance data?”

The web-base architecture for the project is composed of the following elements as found in Figure 1 – Web Architecture:

- **Database Server** is the central repository of all data for the web application. 97% of the data for the application resides in a Microsoft SQL Server 2000 Database. Other data stored on the server include PDF's and documents uploaded to the web application. Security is implemented through Stored Procedures which can only be executed in the context of a valid user via a Windows 2000 Server authenticated user.

- **Web Server** is utilized to serve up the application pages to an authenticated user. The application utilizes Active Server Pages (ASP) to dynamically generate web pages on the fly. Active X, Java and VB Scripting allow the web server to provide data in either HTML format or in the form of Microsoft Office products such as Excel or Power Point. All data coming from the web server over the internet is encrypted using 128 bit key encryption via Secure Socket Layers (SSL).
- **Oil and Gas Accounting System** can be any commercially available accounting application as per the project specifications. This is accomplished through the development of a customized load program which takes data from standard LOE financial statements. A database template is used to import the data and correctly map it to the application database. The application has been successfully interfaced with 21 different accounting applications.
- **Client PC** includes any personal computer running Microsoft Windows and Microsoft Internet Explorer 5.5 or above. Microsoft Office is also required to export data to Excel or Power Point.

Business Requirements

The first and primary business requirement is that the application must be easy to integrate into the work flow and systems of an existing E&P company (referred to as E&P throughout the rest of the paper). Although it is important for all parties to be aware of performance, the software must not interfere with the E&P's primary efforts. Instead, the application provides vital information allowing operations to proceed more efficiently while enhancing the overall communication between parties involved in the project.

To facilitate the above requirements the application must:

- Interface with E&P's existing accounting system without requiring any specialized reports.
- Require less than 1 hour per month of attention by an E&P's accounting clerk.
- Allow financial and production data to be uploaded to the application by an E&P company.
- Provide automated email notification to interested parties concerning integrated work processes and data flow.
- Allow all parties to upload forecasts which become the performance criteria of a project.

Data Analysis

Data in and of itself is of limited use without an appropriate suite of tools to evaluate project performance. It was determined early in the design process that the application would “manage by exception”. The system allows portfolio managers to identify thresholds, or performance objectives to measure each project. For example, the system can be set up to automatically notify by email appropriate personnel when lifting costs are 10% greater than the target objective for 3 consecutive months. This keeps management focused on performance objectives.

A second goal was to encourage managers to discover and take advantage of economic opportunities. The design criteria required the application include features to determine the value of a project or the entire portfolio. Futures prices tracking, hedging systems, economic forecasts, flip payout, asset play and other tools allow the manager to determine the value a project.

Additional business specifications included:

- Financial and production reports must be uniform but dynamically driven through a template model to facilitate easy and simple modifications.
- “Drill down” – ability to analyze data at the project, field, and well levels so that project non-conformances or economic opportunities can be realized.
- Automated work flow and communication between entities.
- Resulting analysis and raw data must be available through exports to Microsoft Office products.
- Be intuitive and easy to use by both investors and E&P personnel.

Software Development Methodology

A software development methodology ensures that an application is designed with “best practices” and that systems are in place to guarantee a continued process of quality improvement. This is accomplished by utilization of a systematic methodology throughout the entire development lifecycle. The Software Engineering Institute (SEI) at Carnegie Mellon Institute in Pittsburgh established a set of standards and guidelines for software development known as the Capability Maturity Model (CMM). Table 1 below identifies 5 key levels of maturing software as defined by SEI. CMM continues to be the development methodology employed to ensure that the application meets the goals and objectives of the financial institution sponsoring the project.

The software development phase has encompassed a 5 year period and 5 distinct development phases (not to be confused with the 5 levels of CMM). The last two development phases demarcate completion of the Carnegie Mellon Institute Capability Maturity Model.

When the project was initiated Level 1 of CMM was already accomplished by the financial institution using off the shelf software. A system of manually manipulated spreadsheets to track portfolio performance was in place. However, keeping those spreadsheets up to date required excessive efforts and manpower. It was determined that the necessary headcount per project was neither desirable nor sustainable.

Level 1 Initial	Processes are ad hoc and occasionally chaotic. Few processes are defined, and success depends on individual effort and heroics.
Level 2 Repeatable	Basic project management processes are established to track cost, schedule and functionality. A process discipline is in place to repeat earlier successes on projects with similar applications.
Level 3 Defined	Management and engineering processes are documented and integrated into a standard software process. Projects use an approved, tailored version of the organization’s standard software process.
Level 4 Managed	Detailed measures of the software process and product quality are collected. Processes and products are quantitatively understood and controlled.
Level 5 Optimizing	Continuous process improvement is aided by quantitative feedback from the process and from piloting innovative ideas and technologies.

Table 1 - Carnegie Mellon Institute Capability Maturity Model

Phase 1 of the software development project lasted 45 days and propelled the project into Level 2 of CMM. At the end of phase 1, the proof of concept and initial roll out of the application was accomplished. The software application was successfully deployed for two test E&P entities. The project was evaluated as a success and it was determined to proceed with more aggressive application development efforts and subsequent rollout across the portfolio.

Phase 2 of the project lasted for 7 months and included expanding core capabilities of the application. Additionally, application deployment strategies were implemented so that the software could be installed to 10 additional E&P entities. At the end of phase 2 of the software development process level 3 of CMM was obtained. Basic managerial processes were now coded and the application began to free up organizations to perform analysis rather than data management.

Phases 35 of development lasted approximately 9 months each. Each of these phases included new analytical tools never conceived prior to the previous phase. As the multi-disciplinary teams worked synergistically together, new ideas emerged to monitor value and performance. During phases 4 and 5 of development, level 5 of CMM was obtained. At the same time the application was rolled out to an additional 24

partnerships. The application has now entered the mature phase of the development cycle with modifications being primarily driven by market forces and changing strategies of the financial institution.

Challenges of Deployment

Deployment of a new software application in any organization is a risky proposition at best. Even a well designed application faces insurmountable opposition if not properly introduced. Most people and organizations have difficulty adapting to change. The key to managing change in an organization is to get a high degree of “buy in” or acceptance from the very first planning meeting. With proper preparations, the initial setup procedures set the tone toward an expectation of success for the rest of the deployment process.

The initial planning meeting demonstrates that deployment of the new application will require little if any effort on the part of an E&P company. This is accomplished first by a review of the application and its ease of use. Once a user discovers that uploading data simply involves dragging and dropping a standard report out of their accounting system, fears of an arduous process are relieved. While demonstrating the software it is helpful to concentrate on ease of use features, help systems, and automated email which assists the user in performing their job functions as a part of a multi-disciplinary team.

The next step in a successful deployment is to put the onus on the software developers to create a custom load module based on the accounting and production data available from the E&P’s accounting software. Since many E&P companies have limited IT capabilities the loading system uses a custom template for each E&P. The custom load template is a cost effective implementation. An E&P company’s accounting data is integrated to the software application in less than a two week period of time (actual software development time is normally less than 40 hours).

Finally, the capstone to a well executed deployment strategy is a comprehensive training program. After the custom load is completed and at least one month of actual production is loaded into the system, then users of the application are ready to receive training. There is something particularly motivating by actually using the application on live company data. This grabs the attention of the user versus a bogus training database. Since there is ample security and safeguards for changing data, training on live company data has not represented a problem, but rather significantly increased the motivation of the learner.

Using the above deployment strategy, over the last 5 years the application has been successfully integrated with 36 different E&P organizations. In that time, there has not been a single deployment failure.

Application Tools

Performance Analysis

The core of the portfolio management software is a variance analysis tool measuring the performance of a project against a budgeted forecast. A set of financial line items (i.e., Gas Production, Lifting Cost, CAPEX, etc.) is established for the project. This report is very similar to an extended version of an LOE report found in most oil and gas accounting applications. Figure 2 shows a tabular report calculating a percent of forecast ($\text{Actual} / \text{Forecast} * 100$) for each line item in the variance report. This report also displays monthly actuals as well as monthly forecasted projections.

One of the requirements of the application is that all tools export applicable data to an Excel workbook. Each workbook stands alone and is capable of performing “what if” analysis. To accomplish this, both raw data and formulas are appropriately exported to the workbook (simply exporting data or calculated results is insufficient).

The Excel version of the variance report includes worksheets where Actual, Forecasted and Percent of Forecast tabular tables are placed. Additionally, the workbook includes worksheets where each line item is analyzed in greater detail. By clicking on the appropriate tab, each line item’s actual vs. forecasted data is available in tabular and graphical form. Figure 3 is an example of the variance report exported to Excel.

Production at a Glance

One of the strengths of the application is the ability to load an unlimited number for forecasts throughout the history of the project. Figure 4 shows an example graph of risk adjusted production versus time. This graph demonstrates the ability to track actual production against multiple forecasts. The green line (Forecast #1) represents the deal origination forecast utilized as the basis for the procurement of the properties associated with the project. An additional forecast is delineated by the purple line (Forecast #3) which begins in the 3rd year of the project. Thus, the application has the ability to track multiple forecasts throughout the life of the project. An unlimited number of forecasts can be stored for the project with a potential of 3 different forecasts being displayed on any given graph. The system allows the user to select the forecasts they would like to see displayed in the 30 different graphs available in the application.

The third forecast display on the graph is a management forecast (cyan line) calculated from input parameters found in a setup page. The management forecast is actually a concatenation of several annual forecasts for the project factored at some percentage (in this case 95%). The cyan line is 95% of forecast #1 for the year 2001, 95% of forecast #2 for the year 2002 (forecast #2 is not displayed in the graph), and finally 95% of forecast #3 for 2003 (purple line) till the property becomes non-commercial. The user has complete control over which forecasts make up the management

forecast, length of time each forecast is used, and the percentage.

Management Triggers

This management forecast is the plumb line for monitoring performance objectives via automated email. Each time new monthly data is uploaded, the system automatically validates the new data against performance triggers. For example, suppose that a production trigger is defined as “Underperformance = 95% or below of current forecast for 3 consecutive months”. If the E&P uploads a new monthly data file that includes data below 95% of the management forecast for the third consecutive month, then the system automatically generates an email identifying the non-conformance. See figure 4 as an example of how this production breach would appear in the Glance Production report.

The system allows the portfolio manager to control the recipients of such email notifications. It does not require the user to constantly come to the website to review project performance. If there is a project that is underperforming, appropriate personnel can be automatically notified by email. Performance objectives can be defined for Production, LOE, Lifting Costs and Hedging as seen in figure 5 – Management Trigger Definition.

Management Dashboards

In addition to monitoring the performance of any one deal, the application allows management to understand the performance of the portfolio as a whole. Management Dashboards allow the user to keep track of portfolio performance as a function of exposure, percentage of oil and gas production, operating costs, production and lifting costs as shown in Figure 6. Additional dashboards include interest coverage ratio, borrowing base utilization, gas and oil hedging, futures pricing, reserves reconciliation and a host of other performance measures allowing the project manager to track both performance and value added.

Tracking Asset Value

Another goal of the application is providing mechanisms to assist management in identification of economic upside potential. The application includes a suite of tools to track ever changing economic conditions along with the performance of the portfolio. These tools allow one to understand value of a specific project or the entire portfolio.

An example of one of these tools is the Hedging System utilized to reduce the risks associated with pricing volatility. The hedging system allows development and maintenance of a hedging strategy by recording all hedge contracts, settlement dates, volumes, prices and associated performance objectives. The system examines hedges by individual partnership or on a portfolio basis, calculates breakage values and performs FASB 133 hedge effectiveness analysis. With the hedging system you can quickly understand the impact of risk mitigation

within a partnership or portfolio. Figure 7 is an example of the Hedge Breakage Analysis report found in the system.

Authorization for Expenditure Tracking and ROI Analysis

The AFE management system provides operators and financial institutions the ability to quickly and efficiently process AFE’s. The built in task scheduling system allows the user to define workflow processes which are supported by automated email notification, essentially walking an AFE through multi-disciplinary multi-organizational teams. The AFE system can include attachments and supporting documents for AFE requests. The system tracks post AFE performance documenting successful strategies and operator’s performance. These tools include a variety of reports to focus capital expenditures on activities that produce results and increase value. Figure 8 – AFE Status Map demonstrates the ability to track workflow processes.

The CAPEX Gantt chart is used to track the long term development plan of a project. This report reveals development projects that are in budget (green) as well as projects have exceeded their budgets (red). In each case the development schedule is tied back to the annual forecast which includes PUDs and PDNPs associated with a drilling or development program.

This report provides a good handle on the overall efforts in adding value to the project. The user sees the overall budget capital spent as well as anticipated expenditures. Figure 9 is an example of the CAPEX Gantt Chart.

If a particular AFE requires further analysis, the user can drill down to examine additional data. Figure 10 demonstrates a review of the current status of a drilling effort. This report allows tracking of a drilling program in terms of both depth achieved and costs. Budgeted depths and cost are plotted against actual depth and cost.

Security

Since the application contains confidential and proprietary data, state of the art security architecture was utilized in design and construction. The system uses advanced security technologies and encryption algorithms to ensure that data remains uncompromised. Secure servers, databases, network protocols and security procedures as required by Fortune 100 companies have been implemented throughout the system.

The security strategy involves a multi-layered approach including:

- Transmission (SSL)
- Identity (userid and password)
- Encryption of data
- Isolation of processes, permissions and DB
- Lock down of servers and other tools
- Firewall, DMZ, secure network
- Intrusion detection
- Physical security

Detailed information about security systems is outside the scope of this paper. However, over the past five years, two code reviews and security audits have been performed by independent auditors. In each case the system passed the audit and all recommendations from auditors for additional improvements have been implemented.

Conclusions

Although timely portfolio analysis has been difficult in the past, new technologies associated with the digital oil field are propelling change in the industry. Web technologies are now being harnessed in such a way that all interested parties can be informed on a timely basis concerning project performance. These same technologies allow E&P companies and portfolio managers to focus efforts on actions that increase value.

The original goals of the project were achieved by the completion of phase 1. The project was deemed a success and additional funding for the past 5 years has substantially increase the breath and depth of tools which comprise the application. The portfolio management system has benefited by the proactive input of over 300 industry professionals throughout the application development and deployment cycles. The application now consists of over 60 different analytical tools to analyze the performance of a portfolio.

The application continues to be used by a major private equity player currently managing a 2.3 billion dollar portfolio. The comprehensive features of the application allow the aforementioned portfolio to be managed by a staff of 5 asset managers. This same staff of 5 approves over \$100 million in AFE's annually.

Nomenclature

Active Server Page. A document that contains embedded server-side scripting. ASP-compatible Web servers can execute these scripts. On the client side, an ASP is a standard HTML document that can be viewed on any platform using any Web browser.

Active X. A Set of platform independent technologies developed by Microsoft that enable software components to interact with one another in a networked environment, like the Internet.

CMM. Capability Maturity Model - defined by the Software Engineering Institute (SEI) at Carnegie Mellon University. Software Development Methodology which describes the level of capability and maturity a software product.

HTML. Hypertext Markup Language - The coded format language used for creating hypertext documents on the World Wide Web and controlling how Web pages appear.

Java Script. A scripting language developed by Netscape and Sun Microsystems that is loosely related to Java. JavaScript code can be embedded in a Web page along with HTML code.

SSL. Secure Sockets Layer. A protocol designed by Netscape Communications to enable encrypted, authenticated communications across the Internet. SSL used mostly in communications between web browsers and web servers. URL's that begin with 'https' indicate that an SSL connection will be used. SSL provides 3 important things: Privacy, Authentication and Message Integrity.

VB Script. A subset of the Microsoft Visual Basic programming system. Microsoft Internet Explorer version 3.0, along with other browsers, can read VBScript programs embedded in HTML pages. VBScript programs can be executed on either the browser machine or on the World Wide Web server.

References

1. AlMatroushi, S. "Development of a Competent Workforce for the Oil and Gas Sector", *Society of Petroleum Engineers*, SPE 88654. Presented at the 11th Abu Dhabi International Petroleum Exhibition and Conference, Abu Dhabi, U.A.E., October 10-13, 2004.
2. Chiri, K. "Knowledge Management Strategies to Combat Tomorrow's Challenges – Lessons from Woodside Energy", *Society of Petroleum Engineers*, SPE 88532. Presented at the Asia Pacific Oil and Gas Conference and Exhibition, Perth, Australia October 18-20, 2004.
3. Starling, S. and Robertson, J. "Career Development for a Sustainable, Safe and Competitive Petroleum Industry", *Society of Petroleum Engineers*, SPE 88512. Presented at the Asia Pacific Oil and Gas Conference and Exhibition, Perth, Australia, October 18-20, 2004.
4. Gibson, J. "Knowledge Management and New IT Architecture Will Maximize Upstream Value-Creation", *Society of Petroleum Engineers*, SPE 74363. Presented at the International Petroleum Conference and Exhibition, Villahermosa, Mexico, February 10-12, 2002.
5. Daher, E. "Business Process Re-Engineering in the Upstream Sector of E&P Companies", *Society of Petroleum Engineers*, SPE 81557. Presented at the Middle East Oil Show & Conference, Bahrain, June 9-12, 2003.
6. Theuveny, B., Neeten, J., Kosmala, A., Sagar, R., Donovan, M., Cosad, C. "Web-Based Hosting of Multiassets and Multiusers Production Workflows", *Society of Petroleum Engineers*, SPE 91041. Presented at the Annual Technical Conference and Exhibition, Houston, Texas, September 26-29, 2004
7. Oberwinkler, C. and Stundner, M. "From Real Time Data to Production Optimization", *Society of Petroleum Engineers*, SPE 87008. Presented at the Asia Pacific Conference on Integrated Modelling for Asset Management, Kuala Lumpur, Malaysia, March 29-30 2004.

Web Architecture

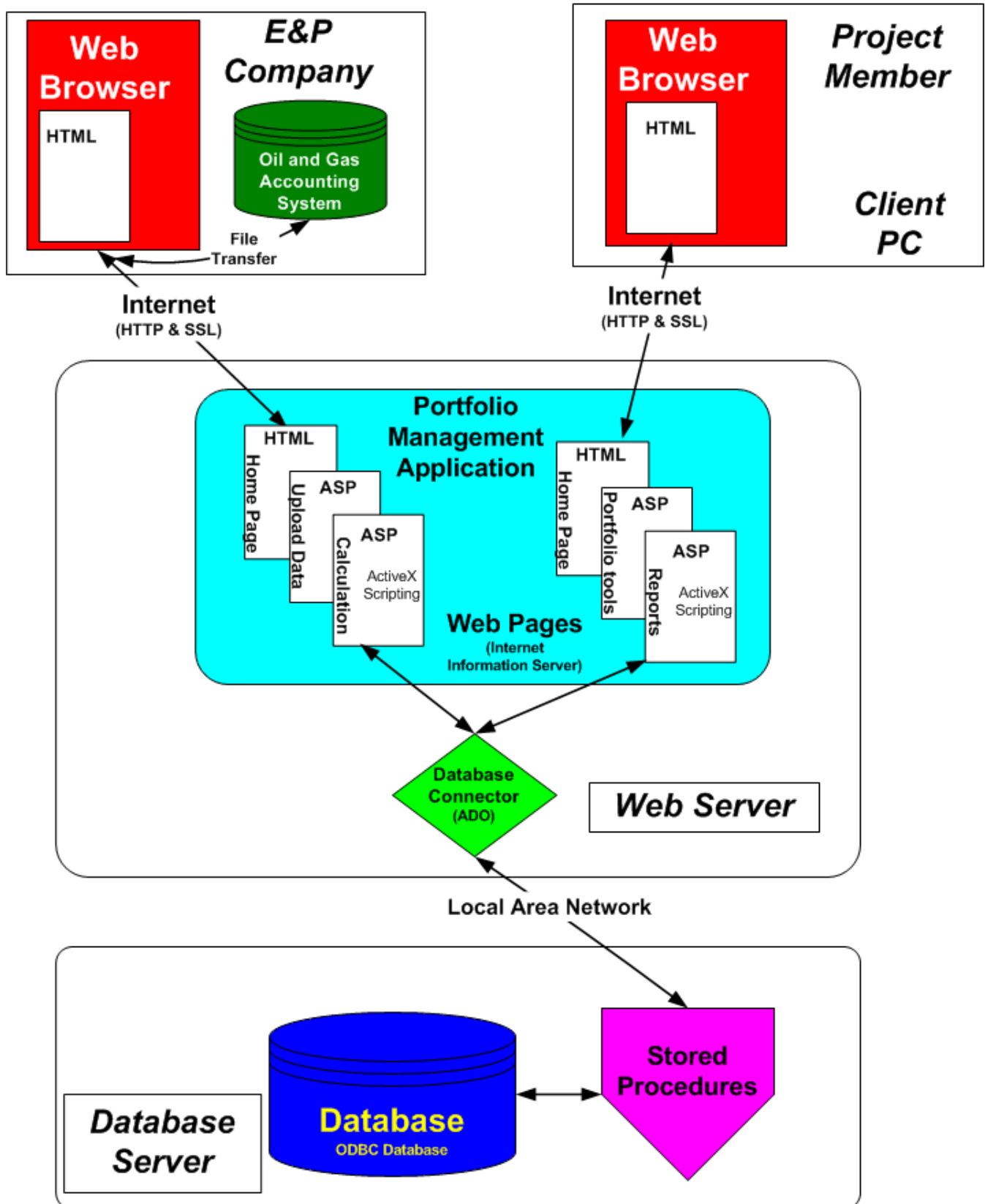


Figure 1 – Web Architecture

Cotton Energy, L.P.										
Variance Report										
July 1999 - March 2001										
								Gas/Oil Ratio:	6	
								MMBTU:	1	
								Product Ratio:	1.50	
								Other Ratio:	1.50	
(vs. Total Reserves, Forecast as in PM Setup)								Report Date: Tuesday, February 08, 2005		
% of Forecast (Actual/Projection)	7/1999	8/1999	9/1999	10/1999	11/1999	12/1999	1/2000	2/2000	3/2000	4/2000
Production										
Net Oil (BBLs)	99%	103%	108%	109%	110%	107%	102%	94%	97%	90%
Net Products (BBLs)	804%	1,020%	1,035%	937%	901%	871%	109%	110%	118%	130%
Net Gas (MCF)	92%	95%	95%	94%	89%	103%	96%	110%	123%	126%
Other Production	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Wellhead Pricing										
Oil (\$/BBL)	137%	142%	160%	153%	169%	177%	103%	117%	123%	104%
Products (\$/BBL)	145%	175%	181%	175%	164%	164%	89%	97%	79%	88%
Gas (\$/MCF)	114%	130%	149%	131%	166%	113%	101%	109%	115%	127%
Other Pricing	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Revenue (\$)										
Oil Sales	136%	146%	172%	166%	186%	189%	105%	110%	120%	93%
Product Sales	1,169%	1,789%	1,873%	1,643%	1,477%	1,429%	97%	106%	93%	114%
Gas Sales	105%	124%	141%	123%	148%	116%	97%	120%	142%	160%
Hedge Income	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Other Sales	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total Property Operating Income	125%	143%	165%	150%	172%	156%	89%	95%	107%	104%
Direct Operating Expenses (\$)										
Severance Tax	85%	124%	315%	177%	351%	(63%)	122%	96%	80%	178%
Ad Valorem Tax	0%	0%	2%	0%	0%	3%	403%	1%	0%	(0%)
Routine Lease Operating Expenses	0%	216%	105%	107%	111%	102%	118%	134%	144%	115%
Workover / Plugging Expenses	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
COPAS	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Other Expenses	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total Direct Operating Expenses	16%	228%	157%	134%	167%	88%	167%	129%	131%	136%
Lifting Cost	0%	269%	129%	132%	138%	122%	147%	155%	150%	127%
Gross Operating Profit	86%	39%	74%	70%	77%	87%	32%	45%	54%	50%
Other Operating Expenses										
Management Fee	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Insurance	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
General & Administrative	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Other Expense (Income)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total Other Operating Expenses	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Figure 2 – HTML Variance Report

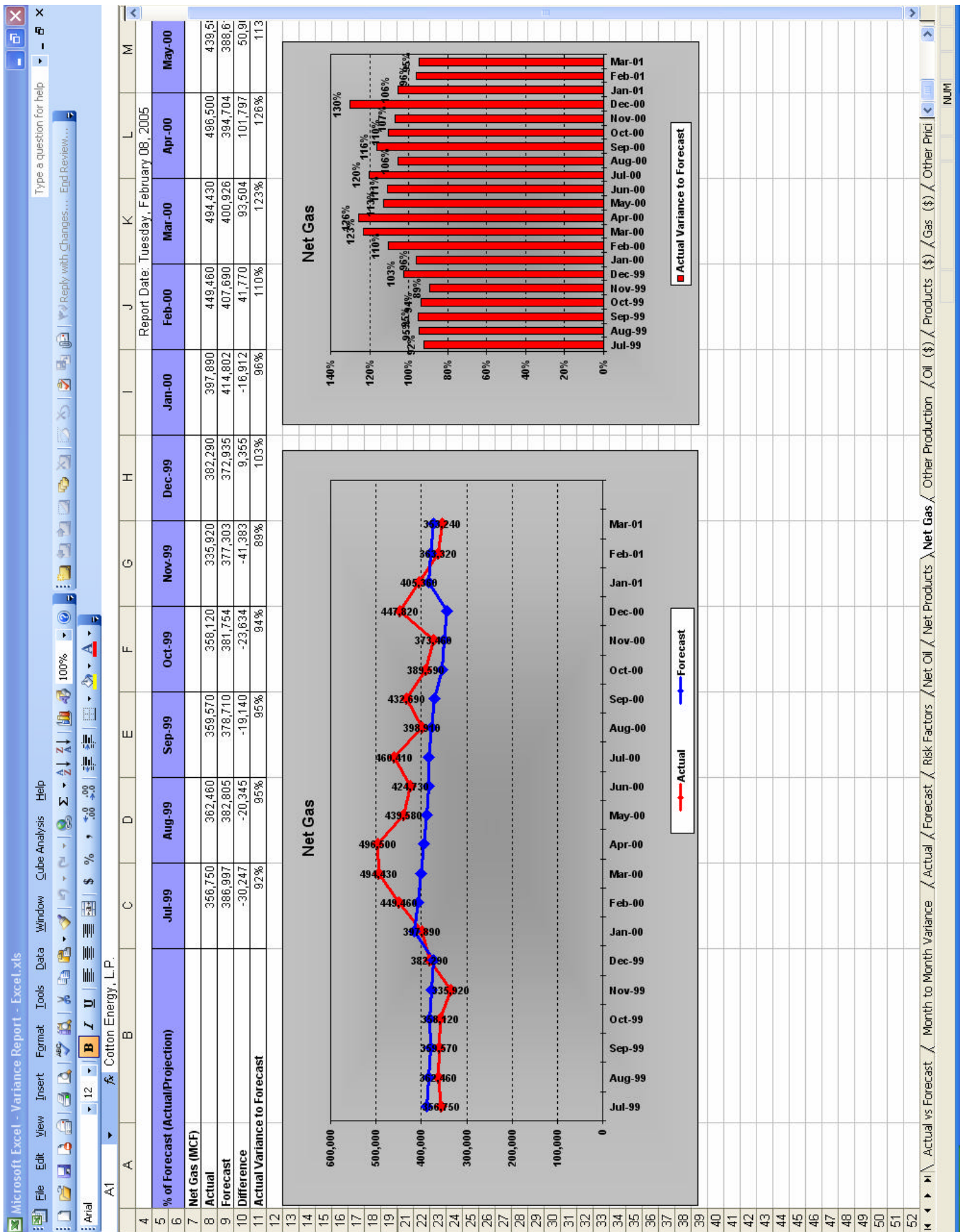


Figure 3 – Excel Variance Report

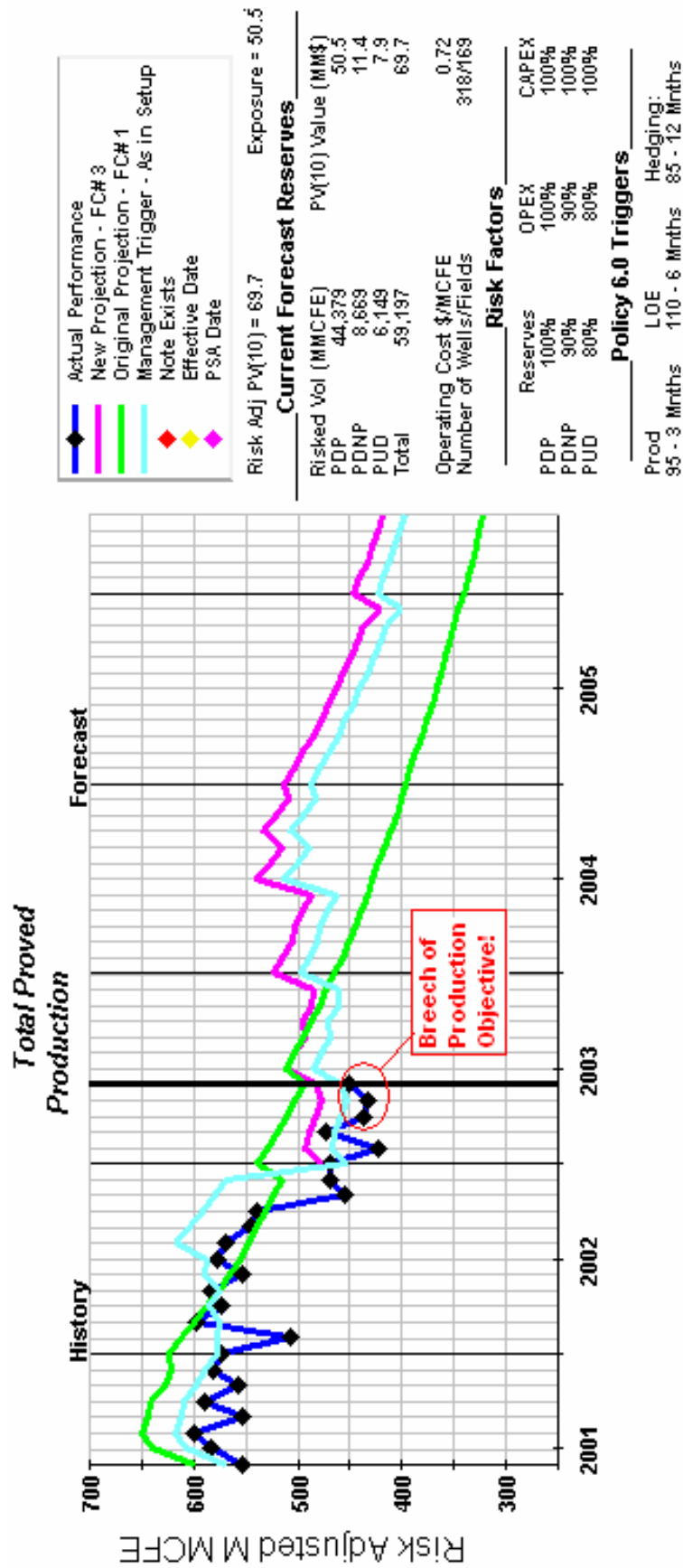


Figure 4 – Glance Production

Main Parameters	Model Key Assumptions	Exposure MF-Payout	DD&A	Forecasts Monthly Load	Forecast Detail	Contact Information	Partnership Agreement	Monitoring	Quarterly Reports	Event Notification	LOE Sub-Accounts
------------------------	------------------------------	---------------------------	-----------------	-------------------------------	------------------------	----------------------------	------------------------------	-------------------	--------------------------	---------------------------	-------------------------

Legend Editable Uneditable Save

Default Forecasts		Partnership Monthly Load Information	
Base Forecast:	038--6/1/1998 7strp/hdge	Date of Last Load:	4/1/2000
Current Forecast:	001--1/1/2003 7strp/hdge	Accounting Period:	2/1/2000
Portfolio Evaluation Forecast:	as in FI Setup	Level 1 Description:	Field
Gas BOE Ratio (mcf/bbl):	6.00	Level 2 Description:	Well
Product BOE Ratio (P bbl/Oil bbl):	1.50	Data Grace Period (days):	45
Other Ratio (X/Oil bbl):	1.50		
MMBTU Factor (MMBTU/MCF):	1.000		

Management Triggers			
Trigger	Under Performance	Duration (Months)	Over Performance
Production Breach:	90.0%	3	110.0%
LOE Breach: DOE	110.0%	3	90.0%
Lifting Cost \$MCFE LOE	110.0%	6	90.0%
Hedging Breach:	85.0%	12	100.0%

Figure 5 – Management Trigger Definition

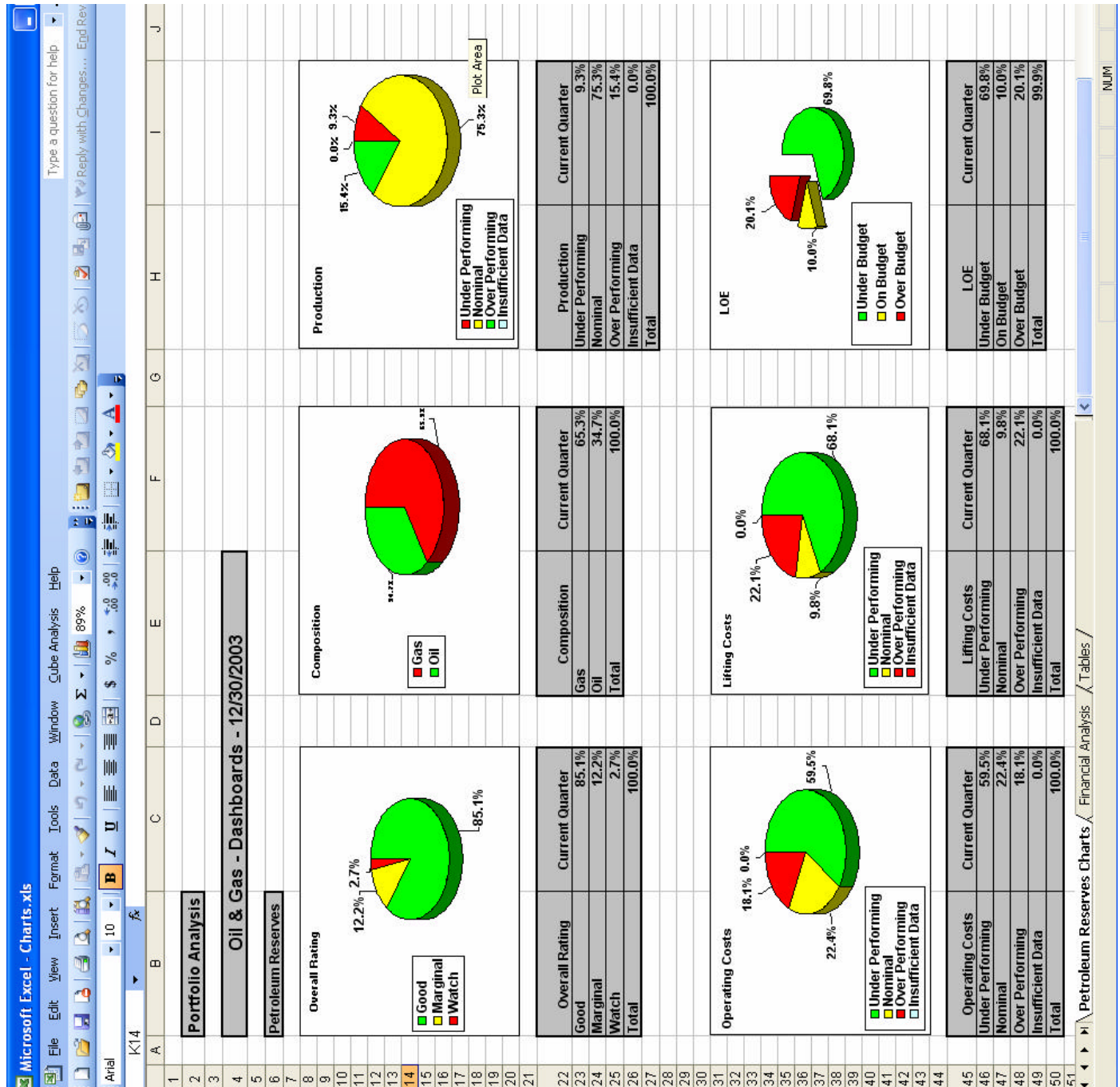
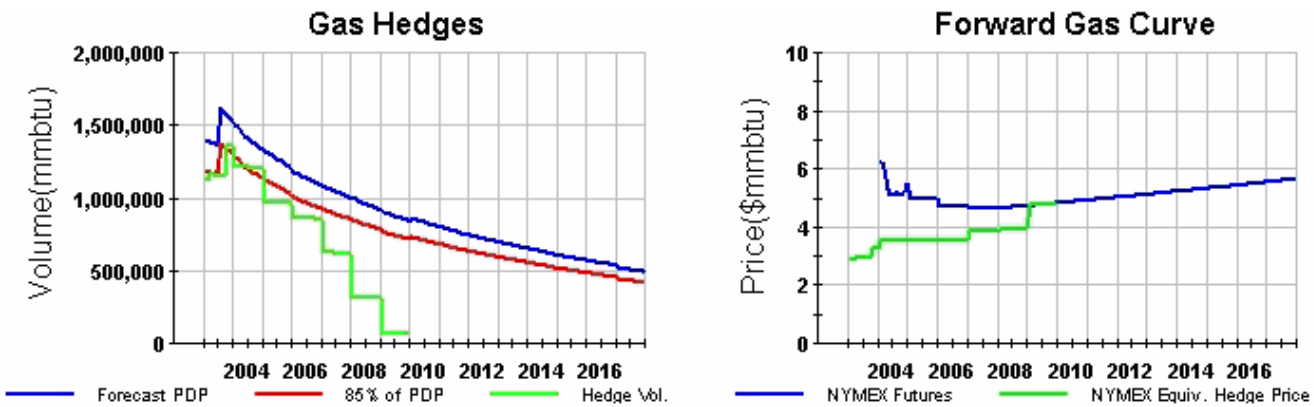


Figure 6 – Management Dashboards



Report Date			12/15/2003	Year	Annualized Forecasted PDP Volumes (mmbtu)	SWAP Volumes (mmbtu)	Percent Hedged	Headroom to 85% Volume Hedged	NYMEX Equivalent Hedge Price	NYMEX Futures
Effective Date			1/1/2004	2004	16,970,910	14,509,315	85.5%	-84,042	3.0128	5.4371
Dis. Breakege Value (\$1000)			-60,475.319	2005	15,174,860	11,575,944	76.3%	1,322,687	3.5307	4.9400
Avg. NYMEX Equiv.			3.6399	2006	13,564,846	10,300,296	75.9%	1,229,823	3.5578	4.7200
Curve Quote Date			12/31/2003	2007	12,457,265	7,441,188	59.7%	3,147,487	3.5591	4.6300
Discount Rate			4.000%	2008	11,472,751	3,713,220	32.4%	6,038,619	3.8267	4.6800
Portfolio				2009	10,454,522	779,268	7.5%	8,107,076	3.9320	4.7736
Price Diff Quote Date			9/30/2003	2010	9,940,394	0	0.0%	8,449,335	4.7850	4.8691
Partners	Breakage	Forecasts		2011	9,215,981	0	0.0%	7,833,584	-	4.9665
Partner - 1	-798.183	1 - 7/1/2003 7strp/hdge		2012	8,623,861	0	0.0%	7,330,282	-	5.0658
Partner - 2	-6,630.194	1 - 4/1/2003 7strp/hdge		2013	8,076,267	0	0.0%	6,864,827	-	5.1671
Partner - 3	-1,847.213	1 - 5/1/2003 7strp/hdge		2014	7,542,720	0	0.0%	6,411,312	-	5.2704
Partner - 4	-12,514.410	5 - 1/1/2003 7strp/hdge		2015	7,031,021	0	0.0%	5,976,368	-	5.3759
Partner - 5	-880.649	4 - 1/1/2003 7strp/hdge		2016	6,600,501	0	0.0%	5,610,426	-	5.4834
Partner - 6	-11,847.083	5 - 1/1/2003 7strp/hdge		2017	6,035,213	0	0.0%	5,129,931	-	5.5930
Partner - 7	-7,365.698	2 - 1/1/2002 7strp/hdge		2018	0	0	0.0%	-	-	-
Partner - 8	-16,630.888	3 - 1/1/2003 7strp/hdge		Grand Total	143,161,112	48,319,231	-	73,367,714	3.6399	5.0694
Partner - 9	-2,874.194	4 - 1/1/2003 7strp/hdge		Month	Monthly Forecasted PDP Volumes (mmbtu)	SWAP Volumes (mmbtu)	Percent Hedged	Headroom to 85% Volume Hedged	NYMEX Equivalent Hedge Price	NYMEX Futures
Partner - 10	-7,564.213	3 - 1/1/2003 7strp/hdge		1 / 2004	1,502,484	1,215,136	80.9%	61,975	3.5322	6.1890
				2 / 2004	1,486,112	1,214,002	81.7%	49,194	3.5319	6.1890
				3 / 2004	1,470,040	1,212,880	82.5%	36,654	3.5316	5.9960
				4 / 2004	1,444,881	1,211,769	83.9%	16,210	3.5314	5.2770
				5 / 2004	1,430,174	1,210,671	84.7%	4,976	3.5311	5.1120
				6 / 2004	1,416,115	1,209,584	85.4%	-5,886	3.5308	5.1120
				7 / 2004	1,402,296	1,208,507	86.2%	-16,555	3.5305	5.1350

Figure 7 – Hedge Breakege

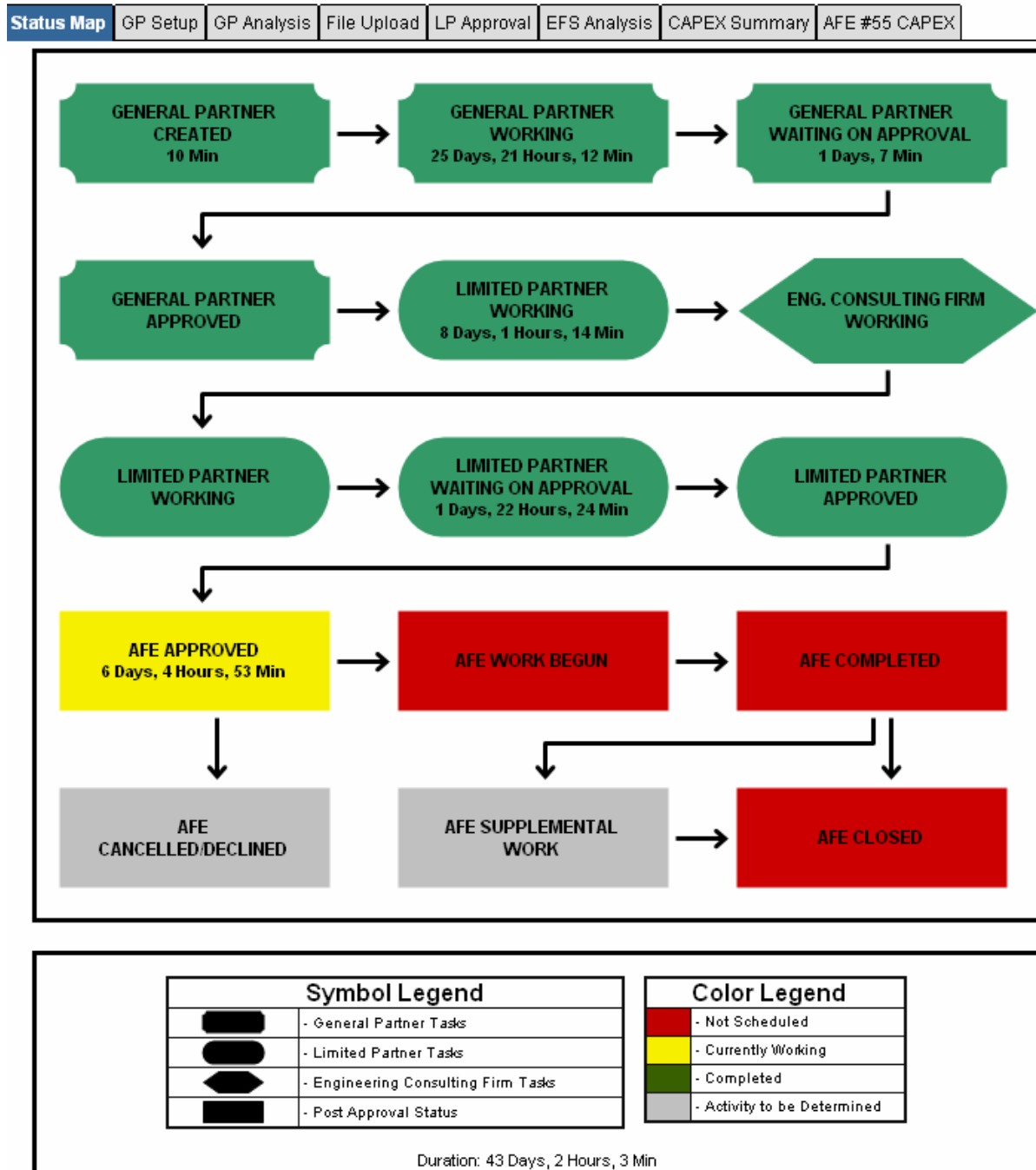


Figure 8 – AFE Status Map

Microsoft Excel - Drilling Gantt Chart.xls

File Edit View Insert Format Tools Data Window Cube Analysis Help

W:\kingdom\itjobs\Clients\Partner\Metrics\Marketing\Powerpoint\Drillr...

100%

Report Date: Wednesday, 1/2/2008

Partnership CAPEX Gantt Chart Report January 2004 - December 2008

Well Code	Lease Name	Field Name	County, State	RsvCat	Net Oil (MMBLS)	Net Gas (MMCF)	10% DCF (M\$)	Start Date	Jan-04	Feb-04	Mar-04	Apr-04	May-04	Jun-04	Jul-04	Aug-04
1	Over Budget															
2	Under Budget															
3	Forecast															
4																
5																
6																
7	486	FOSTER 8-1	ECTOR, TX	PUD	9.976	2.836	66.07	2/1/04		55,071						
8		1 - 3/1/04									53,576					
9	484	TRENT 1-24	ROGER MILLS, OK	PDNP	0.771	88.117	124.683	3/1/04		48,873						
10		2 - 3/15/04									47,965					
11	486	BANNER-GREGG 3.4	SHARE SE	PDNP	6.466	14.743	47.842	4/1/04			22,656					
12		3 - 4/20/04									25,307					
13	365	ARON J 2-33 (OP II)	OAKLEY	PDNP	2.895	180.372	249.453	5/1/04					126,771			
14		4 - 6/15/04											85,310	41,580		
15	431	NEWCOMB 5-18	CUSTER, OK	PUD	0.154	13.483	15.984	5/1/04					13,105			
16		5 - 5/13/04											12,899			
17	492	HORNBuckle A-3	WOOD, TX	PUD	16.348	1069.8	1622.85	5/1/04					1,413,912			
18		6 - 7/16/04											756,598	263,541	391,773	
19	494	CAMPBELL 2 (JACKSON)	JACKSON, TX	PUD	0	79.835	107.76	5/1/04					76,676			
20		7 - 5/15/04											74,695			
21	499	CAMPBELL, LIZZIE 2-10	ELLIS, OK	PUD	0	160.239	186.811	5/1/04					132,103			
22		8 - 6/2/04											85,469	86,231		
23	265	JUMONVILLE 5-97	POINTE COUPEE, LA	PDNP	14.112	24.004	84.436	6/1/04						70,147		
24		9 - 6/18/04												69,523		
25	382	10 - 6/23/04	PATTERSON CANYON	PUD	15.569	28.464	165.051	6/1/04						82,830		
26		In Progress												80,965		
27	488	DESERT SPRINGS UNIT	SWEETWATER, WY	PDNP	0.139	83.452	104.564	7/1/04							2,016	
28																
29	491	DESERT SPRINGS UNIT	SWEETWATER, WY	PUD	0.121	30.849	40.224	7/1/04							10,535	
30																
31	487	CAMPBELL GAS UNIT-1	JACKSON, TX	PDNP	0	79.440	135.50	8/1/04								
32		CAPEX														

Figure 9 – CAPEX Gantt Chart

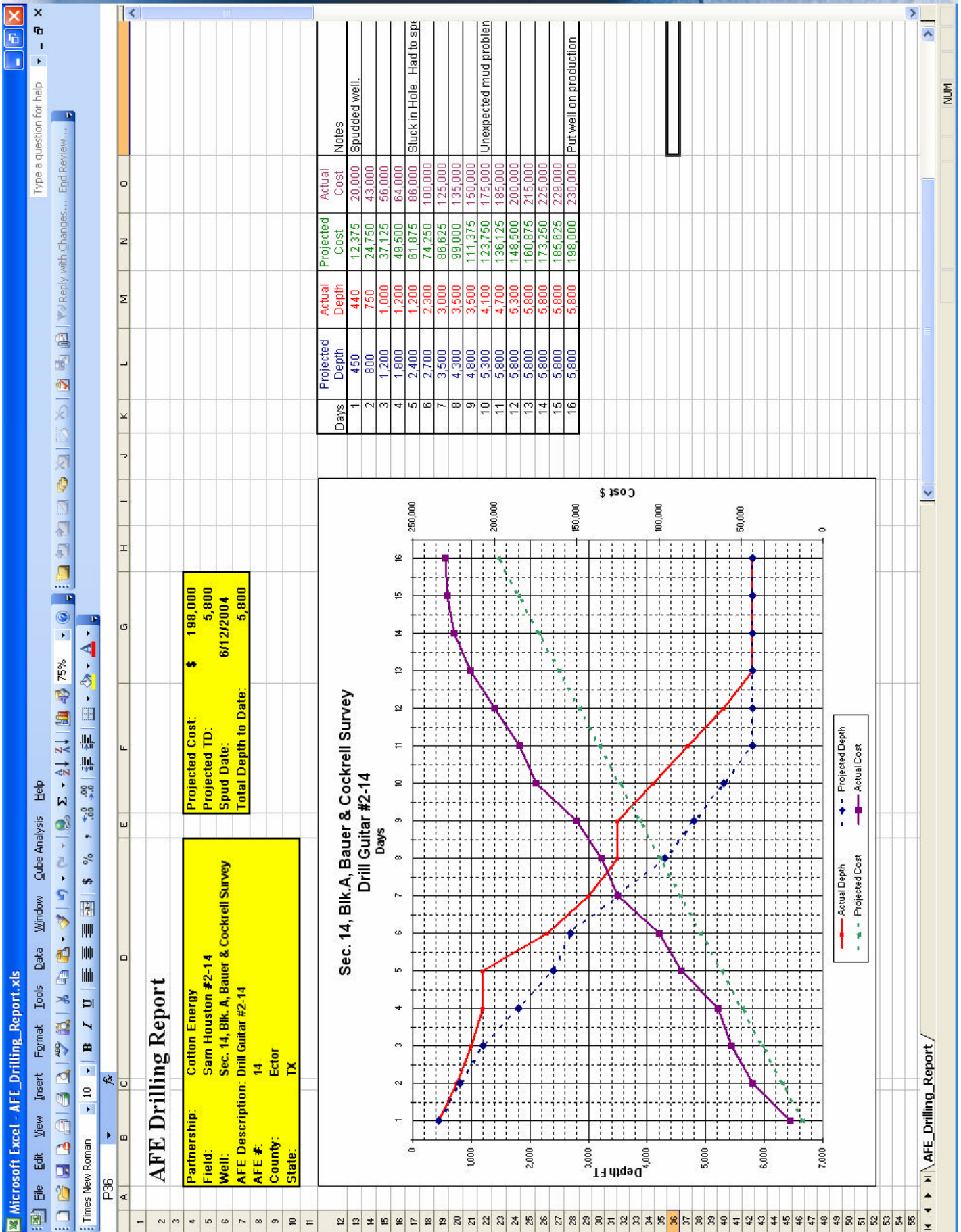


Figure 10 – AFE Drilling Report