



## **You may be interested.**

PIRINC has prepared the enclosed report, *Responding to Higher Prices*.

Current crude prices are far above prices prevailing earlier in the decade and, in nominal terms, prices are the highest ever. As the public is well aware, the escalation in prices has supported record profits by the oil industry. While large numbers of shareholders---including indirectly the many participants in pension funds holding shares of oil companies---have benefited from the industry's good fortune, the more acute public concern is what is the industry doing with its higher profits to improve supply. Industry action to improve supply prospects is already underway, but a full response requires a long time frame to be realized. Moreover, just as industry tried to look beyond earlier depressed prices in making long-term investment decisions, the same applies when prices are extraordinarily high. The result is a smoother, more efficient, investment cycle that pays off in lower costs of future supply, but for the public and political sectors, a less satisfying immediate outcome. The industry is also running up against near-term capacity constraints, as indicated by accelerating costs for labor and critical equipment.

This report considers the issues involved in assessing the industry response to the step-changes in oil prices. It also focuses on developments that are posing new challenges to the established companies in the industry, including growing competition from state-supported companies, changes in policies regarding government take, and changes in political risk. The report also highlights the impact of higher prices on US foreign policy concerns.

For the US, the increased role of well-financed state owned companies in the world oil market has mixed implications. Additional resources for exploration and development promote greater and more diverse sources of supply. But resource-rich countries at odds with US interests have more development options and may perceive less reason to change course. For the major US and other western companies, more players means more intense competition for access to potentially less available promising acreage. While financial strength plays a critical role, the future competitive success of the major companies rests on retaining leadership in ability to mobilize the skills and advanced technology required to find and develop resources in the more challenging environments. Too many others already have the cash to deal with the easier prospects.

If you have any questions or comments, please contact John Lichtblau, Larry Goldstein or Ron Gold.

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## Responding to Higher Prices

### Summary

Beginning in 2003, oil prices have been moving upward, rising from an average of about \$26/barrel for WTI in 2002 to an average of nearly \$57/barrel in 2005 and still further this year through mid-March to an average of about \$63/barrel. Current prices are far above prices prevailing earlier in the decade and, in nominal terms, prices are the highest ever. US natural gas prices also moved up sharply, although aided by a warm winter, they have come off their recent extreme values. As the public is well aware, the escalation in prices has supported record profits by the oil industry. While large numbers of shareholders---including indirectly the many participants in pension funds holding shares of oil companies---have benefited from the industry's good fortune, the more acute public concern is what the industry is doing with its higher profits to improve supply. The evidence shows industry action to improve domestic and international supply prospects is already underway, but a full response requires a long time frame to be realized. Moreover, just as industry tried to look beyond earlier depressed prices in making long-term investment decisions, the same applies when prices are extraordinarily high. The result is a smoother, more efficient, investment cycle that pays off in lower costs of future supply, but for the public and political sectors, a less satisfying immediate outcome. Greater industry efforts are also running up against near-term capacity constraints, as indicated by accelerating costs for labor and critical equipment.<sup>1</sup>

This report considers the different issues involved in assessing the industry response to the step-changes in oil prices. It also focuses on developments that are posing new challenges to the established companies in the industry---in some cases themselves linked to the higher prices---including growing competition from state-supported companies, changes in policies regarding government take, and changes in political risk. The report also highlights the impact of higher prices on US foreign policy concerns.

For the US, the increased role of well-financed state owned companies in the world oil market has mixed implications. Additional resources for worldwide exploration and development promote greater and more diverse sources of supply, both consistent with US policy objectives. But on the other hand resource-rich countries at odds with US interests have more development options available to them and may perceive less reason to change course.

For the major US and other western companies, this development means more intense competition for access to potentially less available promising areas. While financial strength plays a critical role, the future competitive success of the major companies rests on retaining leadership in ability to mobilize the skills and advanced technology required to find and develop resources in the more challenging environments. Too many others already have the cash to deal with the easier prospects.

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<sup>1</sup> In this situation, when faced with capacity bottlenecks for materials and infrastructure, attempts to accelerate exploration and development efforts even further would exacerbate already escalating project cost inflation.

## What Prices Matter?

Current crude prices above \$60/barrel (for WTI) clearly encourage all-out efforts to exploit nearer term supply possibilities but what about longer-term projects where a number of years can elapse, and billions of dollars must be spent, before new supply begins to flow.<sup>2</sup> In principle, the futures market would allow investors to lock in high prices---on March 2<sup>nd</sup>, the end-2012 contract price for WTI was also above the \$60 level. But in fact the futures market is heavily concentrated in the nearer term, with nearly 75% of the total open interest concentrated in contracts expiring within 12 months and over 90% expiring within 3 years. Thus companies contemplating long-term supply possibilities generally have to consider price as well as other risks themselves or in partnership with others. In these situations, companies would take current prices into account but would not rely on what might prove to be a temporary extreme (high or low) price as the basis for planning their future.

A reasonable approximation for how prices for long-term industry planning relate to current prices can be found in the Department of Energy’s Annual Energy Outlook. These outlooks, released at year-end, contain long-term price projections and supply-demand balances that step forward from market conditions at the time the outlooks are developed into the future. The table below shows Reference Case crude price projections for 2010 and 2020 as they have evolved from the 2001 Outlook (released in December 2000) through the latest, 2006 Outlook. Prices are for average refiner acquisition cost of imported crude stated in \$2005. Also shown are the average \$2005 prices for WTI for the years in which the Outlooks were prepared.

From the 2001 through 2004 Outlooks, the 2010 and 2020 Reference Case crude prices showed limited changes, rising by about \$2/barrel between 2001 and 2002 and then remaining nearly unchanged through the 2004 Outlook, which was released end-2003. Over this period, the actual average price of WTI first fell by more than \$5/barrel between 2000 and 2001, then after minimal change in 2002, rose by nearly \$5 in 2003.

	2010	2020	WTI Year Ave.	
2001 AEO	\$24.50	\$25.70	2000	\$34.00
2002 AEO	\$26.20	\$27.70	2001	\$28.40
2003 AEO	\$26.30	\$27.90	2002	\$28.10
2004 AEO	\$26.00	\$28.00	2003	\$32.80
2005 AEO	\$26.40	\$30.10	2004	\$42.60
2006 AEO	\$45.20	\$46.25	2005	\$56.60

\*Refiner Acquisition Cost of Imported Crude adjusted to \$2005 using the GDP deflator.

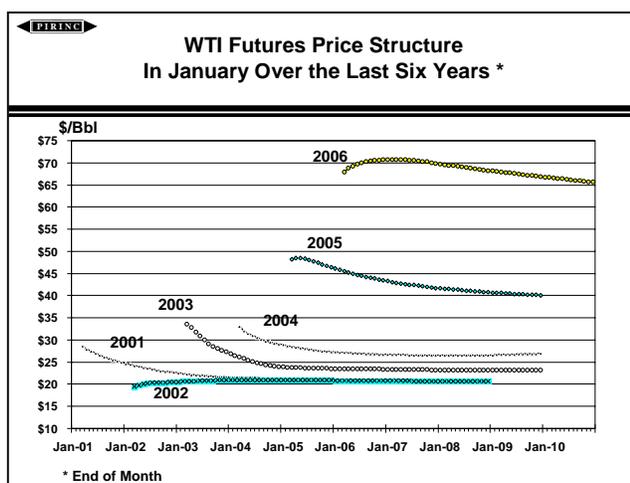
Between 2003 and 2004, the WTI price rose nearly \$10, with only a modest apparent impact on long-term price views. The Reference Case 2010 price between the 2004 and 2005 Outlook rose by only 40 cents while the 2020 price rose \$2.10. The latest Outlook has substantial price changes, with the 2010 price up to \$45.20 and the 2020 price up to \$46.25. Both are nonetheless

<sup>2</sup> For example, in 2002, Chevron and its partners announced the discovery of substantial oil resources in the Tahiti field, located in 4,000 feet of water in the Gulf of Mexico, on leases acquired in 1996. In late 2005, Chevron announced plans to spend \$3.5 billion on facilities capable of producing 125 MB/D of oil and 70 MMCF/D of gas with first production beginning in 2008. From lease acquisition to first production is taking 12 years, from the announcement of the discovery to first production, 6 years.

well below the average 2005 price of \$56.60 for WTI. In effect, the latest Annual Energy Outlook has incorporated step changes in its projections but assumes some fallback from current extreme levels.

The evolution of prices over the course of the Annual Energy Outlook corresponds broadly to the shifts in the long-term price structure of the futures market over the same period. The chart below shows for the month of January in 2001 through 2006 the long-term price structure for WTI on the NYMEX futures market.

In January 2003 and 2004, near term prices were significantly above the earlier years' prices but longer term prices showed far less movement. The January 2005 price structure was substantially higher across the board, although with noticeable backwardation, that is to say with longer-term prices significantly below the near-term levels. The price structure for January 2006 shows another step change upward. As before, there is backwardation in the longer-term, but much less pronounced than before. With due regard for the limited open interest in the longer term contracts, it appears that at least through early 2004, the markets were dubious that higher prices would last. Since then, the futures market has been signaling increasing confidence that high prices will persist.<sup>3</sup>



## Trends in Oil and Gas Production Income and Investment

A longer-term market perspective means less sensitivity to near-term price developments and a less volatile investment profile for the industry. This behavioral pattern shows up clearly in the investment patterns of the major oil companies. The next chart shows in the left panel, the consolidated net after-tax income from oil and gas production reported by the major companies for the 2000-2004 period and, in the right panel, consolidated reported exploration and development spending.<sup>4</sup> The bars split income between US and foreign sources.

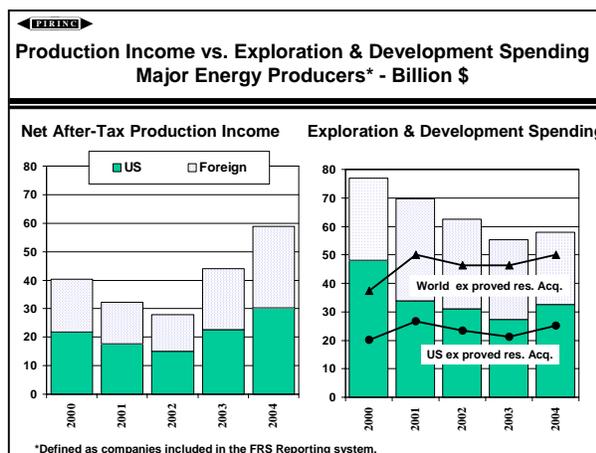
World-wide net after-tax income from oil and gas production fell from about \$40 billion in 2000 to \$32 billion in 2001 and \$28 billion in 2002, an overall decline over the period of about 30%, a decline related to, but steeper than, the 17% decline in average WTI prices over the same period.

<sup>3</sup> As of mid-March, prices for December 2012 WTI, the longest-term contract currently traded is averaging about \$63-\$64/barrel, not very different than the \$64-\$65 range for the May 2006 delivery contract.

<sup>4</sup> Data for years prior to 2000 are impacted by the expansion in the FRS reporting system universe that took place after 1997. Shifts in composition of reporting companies also took place as a result of mergers. Relying on data from 2000 through 2004, the latest year available, minimizes consistency problems associated with these changes.

Worldwide net income recovered to just above the 2000 level in 2003 and then rose sharply (as did oil prices) to nearly \$60 billion in 2004. The US accounted for about half of the worldwide net income reported over the period with both the US and foreign sources showing similar patterns of decline followed by a strong turnaround.<sup>5</sup>

The bars of the right panel show total consolidated oil and gas exploration and development spending. On a worldwide basis spending on exploration and development exceeded net income by about \$35 billion annually in 2000 through 2002. Spending shows in absolute terms (but less so in relative terms), declines in those years about in line with the declines in net income, and a slower turnaround relative to income in 2004.



In its analysis of major energy company spending to find reserves and replace production, the Energy Information Administration (EIA) excludes one category from the exploration and development spending total, namely, spending on acquisitions of acreage with proven reserves. Such acquisitions are effectively transfers of ownership rather than spending on net new reserves or production replacement. In addition, such acquisitions include non-recurring opportunities that can distort year-on-year comparisons.

The lines of the panel show US and worldwide spending net of spending on proven reserve acreage. These figures do show relatively stable trends, with spending higher in 2001-2002 versus 2000 despite declining net income. Spending exceeded net income in 2001 and 2002 by about \$18 billion after roughly matching net income in 2000. Worldwide spending was about level in 2003 and rose slightly in 2004.

To this point the discussion has focused on the major companies as classified by the EIA. However, these companies collectively account for less than half of US oil and gas production (46% and 43% respectively in 2004). Among the generally smaller, independent companies, there is good reason to believe that both incomes and investment cycles are more volatile. In general, smaller firms would tend to be more leveraged and more sensitive to cash flow considerations. They would also tend to have more shorter lead-time projects in their investment portfolio (greater weighting of domestic lower 48 on-shore projects) that could be modified in response to short-term swings in income. Financial results for the EIA samples of publicly traded independent oil and gas producers and oil field companies show increases in net income

<sup>5</sup> Of course 2005 saw another step change in oil prices and net incomes. A more current sampling of quarterly financial data from the major energy companies indicates a further rise in net income from oil and gas production of about 40% versus 2004 with domestic net income growth somewhat less, about 30% and foreign gains somewhat above 40%.

for 2005 versus 2004 of 78% and 139% respectively, gains far greater than those reported by the major companies.

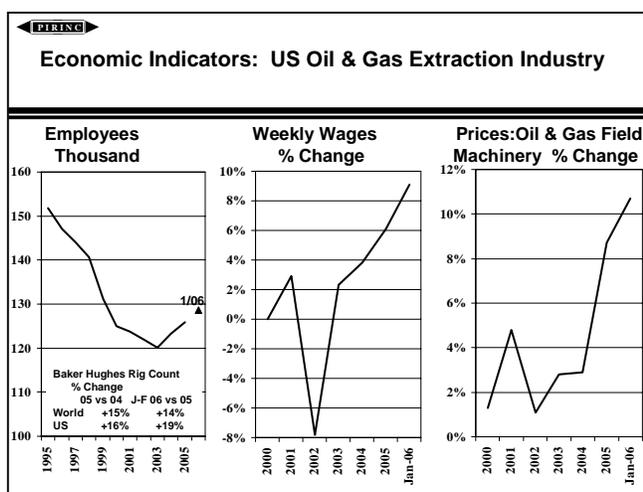
However smooth the investment cycle may be, the increases in industry earnings over the past 3 years, and the expected high level of earnings this year, should by now be translating into significantly greater, visible efforts to expand supply. As the next section discusses, they are indeed under way.

### Indicators of Industry Investment Response and Cost Pressures

There are clear indications of a substantial upswing in industry exploration and development activity, along with indications of growing cost pressures as the industry presses against limits on availability of people and equipment.

The chart below summarizes selected monthly indicators for the Oil and Gas Extraction Industry classification available from the Bureau of Labor Statistics: number of employees, weekly wages, and prices of oil and gas field machinery.

As shown in the left panel, the number of employees bottomed out after a long period of decline in 2003 and has been growing ever since.<sup>6</sup> The lower part of the panel shows trends in a more specialized indicator, the Baker-Hughes rig count. On a worldwide basis, the rig count in 2005 was up by 15% in 2005 versus 2004 while the first two months of 2006 show a 14% gain versus the same two months of 2005. The increase for the US was about the same as the worldwide gain for 2005 but stronger for the first two months of 2006 at 19%.



The increase in activity after a long period of decline is putting pressure on costs. As shown in the middle panel, there has been a significant acceleration in weekly earnings growth, with the rate for the 12 months ending January of this year approaching 10% as opposed to about 4% for all private sector employees. The producer price index for oil and gas field machinery, as shown in the right panel, has also been rising at an accelerating rate. After rising at about a 3% rate in

<sup>6</sup> This series tracks employees in the industry category Oil and Gas Extraction. Employment growth has been even stronger in a related category, Support Activities for Oil and Gas Operations. Employment in this category grew by 19% between 2003 and 2005 as opposed to 5% for employment growth in oil and gas extraction.

2003 and 2004, the index rose by nearly 9% in 2005 and in the 12 months to January 2006, nearly 11%.<sup>7</sup>

Rising costs imply rising incentives for suppliers of needed machinery and equipment to expand their productive capacity, but in the short term, they limit the pace at which exploration and development activity can expand---in effect imposing their own “smoothing” influence on the industry response to higher prices and incomes.

### **Other Limits and Complications in the Response to Higher Prices**

Higher prices are having other effects beyond simply encouraging greater efforts by industry to expand supply, some of which can be contradictory. Higher prices and higher revenues have made it more affordable for some resource rich countries to tighten their terms, including in some cases unilateral changes to existing arrangements, and otherwise reduce both their openness and attractiveness to foreign investors.<sup>8</sup>

While private oil companies include some of the world’s largest enterprises, they by no means have the field to themselves.<sup>9</sup> Many prospective countries have their own favored companies, usually with a substantial state ownership, that have privileged, although not necessarily exclusive, access to domestic oil and gas resources. These include such large entities as Gazprom (Russia), PEMEX (Mexico), PDVSA (Venezuela), Petronas (Malaysia), Petrobras (Brazil) and PetroChina (Peoples Republic of China), all of which reported total assets in 2004 exceeding \$50 billion.<sup>10</sup> This list excludes the large state-owned companies in the Persian Gulf that dominate production in the region with the world’s largest known oil reserves. High oil prices reduce the immediate pressures on such companies and their governments to attract, or even accept, private investment.

High oil prices and long-term concerns about security of supply have encouraged another trend, greater use of state-favored companies to promote supply security. The financial strength and growing competence of some of the companies is also encouraging them to expand their horizons. China has provided the most prominent, but by no means exclusive examples of these developments. The impetus for such activity by Chinese companies is enhanced by the dramatic

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<sup>7</sup> Here too, more specialized indicators show much sharper accelerations in costs. The ODS Petrodata Mid-Water Depth (2,000 – 5,000 feet) Semisubmersible Day Rate Index in February of this year was more than double its level in February 2005 with the fleet utilization rate at nearly 100%. The Deepwater (>5,000 feet) Rig Day Rate Index shows about a doubling and a fleet utilization rate at 100%. These water depths are where many of the most promising, and technologically challenging prospects for new oil and gas supplies are to be found.

<sup>8</sup> Venezuela provides the most prominent example. Since late 2004, royalty rates on heavy oil production have been raised from 1% to as high as 30%. Original service agreements are to be converted into joint ventures with foreign companies limited to a 49% stake. The government has also charged foreign companies with tax evasion and has lodged claims for \$3 billion dollars in back taxes and \$1 billion in back royalties. Tax rates have also been raised.

<sup>9</sup> The three largest private oil companies, ExxonMobil, BP, and Royal Dutch Shell each reported total assets as of year-end 2004 of \$191 to \$195 billion. They were followed by Total at \$114 billion and by Chevron and ConocoPhillips at \$93 billion.

<sup>10</sup> In the case of Petrobras, as part of the economic reforms begun in the 1990s, the company’s original upstream monopoly within the country has been scaled back and government ownership reduced to a minority position.

change in China's supply/demand balance over the past decade and expectations of further changes to come. Between 1995 and 2000, China's net oil imports rose from a modest 0.3 MMB/D or about 9% of total consumption, to 1.4 MMB/D in 2000 or 30% of consumption. The latest near-term projections by the International Energy Agency call for net imports in 2006 to reach nearly 3.4 MMB/D, nearly half of total consumption. China has become the world's third largest oil importer, trailing only the US and Japan.

Three Chinese companies, CNOOC (China National Offshore Oil Corp.), PetroChina, and Sinopec (China Petroleum and Chemical Corp.) are listed on the New York Stock Exchange and have entered into various joint ventures in China with other international oil companies. Indeed, the three largest private oil companies, BP, Shell and ExxonMobil were also purchasers of shares in the IPO's of one or more of the three companies.<sup>11</sup> However, they all have majority state ownership: about 70% in the case of CNOOC, 90% for PetroChina, and 55% for Sinopec.

The unsuccessful bid by CNOOC for Unocal highlighted in a dramatic way the arrival of the Chinese companies on the world stage. The bid raised questions about what security concerns might be involved in an investment by a majority state-owned company in what is considered a strategic sector. There were also issues involving the special competitive advantage that might be available to such a bidder with a potential pipeline to below-market financing from its government. In neighboring Canada on the other hand Sinopec and CNOOC have successfully acquired minority stakes in oil sands projects. The public sensitivity over the Unocal bid reflects the mixed views of China held by the public, a key trade and financial partner, a potential military threat, etc., rather than any inherent hostility to foreign investment in the oil sector.<sup>12</sup> After all, BP and Shell have operated in the US for decades. The Brazilian company, Petrobras, has been a successful bidder both on its own and in partnership with other companies for leases in the deepwater Gulf of Mexico. PEMEX has been a joint venture partner with Shell since 1992 in the operation of the Deer Park refinery in Texas without drawing any adverse public reaction.

In the Unocal bid, the issues also involved the extent to which the Chinese company involved was truly an autonomous commercial enterprise as opposed to an instrument of the Chinese government. The evidence to date is that at least to a certain extent they do act as autonomous commercial enterprises although it would be foolhardy to assume they could or would act without regard to government priorities. Earlier this year, it was reported that the minority investors at CNOOC blocked a proposal that would have allowed its government-owned parent company (with the similar name, China National Offshore Oil Corporation) to invest in overseas oil and gas reserves. The proposal would have contradicted an earlier agreement made at the time CNOOC went public that provided for the newly public company to concentrate on offshore exploration and production while the parent company concentrated on domestic production and

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<sup>11</sup> BP participated in the IPO for PetroChina, Shell in the IPO for CNOOC and all three in the IPO for SINOPEC.

<sup>12</sup> A similar public reaction occurred in the case of the purchase by a Dubai government-owned company of the firm that among other assets, held contracts for the management of several US ports. Although this appeared to reflect a reflexive anti-Arab sentiment, it has not shown up in other circumstances. Saudi Aramco has been a key player for years in the US refining industry through Motiva, its joint marketing and refining venture with Shell.

processing. As a listed Hong Kong company, CNOOC was required to seek approval of minority shareholders for such a change.

This is not to say the Chinese government does not use other companies more directly as policy instruments. CNPC (China National Petroleum Corporation), the government-owned parent company of PetroChina, is major investor in Sudanese oil production and builder of that country's largest refinery. The US imposed trade and investment sanctions on Sudan in 1997 in reaction to that country's human rights violations associated with its still ongoing civil war.<sup>13</sup> CNPC has been in discussions regarding prospective investments with the national oil company of another country subject to US sanctions, Iran.<sup>14</sup> Last August, the company signed a preliminary agreement for a joint venture with PDVSA, the national oil company of Venezuela, whose relations with the US have become increasingly difficult. Last November, the two companies signed contracts providing for CNPC to import 100 MB/D of crude and 60 MB/D of heating oil.

### **Impact of the New Players**

The growing presence of additional, well-financed, ambitious companies is a plus for world oil supplies since, overall, more resources are available for exploration and development. As such, this trend is consistent with the US interest in promoting increased, and diverse, sources of supply---but not necessarily with other policy concerns. In particular, the more development options available to resource-rich countries at odds, or in outright conflict, with the US, the less pressure they face to change course and improve relations.

For the established international oil companies, the growing presence of state-owned (in whole or part) newcomers means greater competition for access to acreage, even (as the Petrobras leasing success indicates) within the US. Where some may be acting as instruments of state policy rather than autonomous entities, this competition can go beyond simply offering better commercial terms. Given the privileged position of such companies in their home countries, some form of partnership arrangements tend to be de facto conditions for access to business opportunities within them. The stronger the financial condition of these companies, the greater their bargaining power over the terms of such arrangements.

While financial strength remains critical, the future competitive success of the major US and other western oil companies rests on retaining leadership in ability to mobilize the skills and advanced technology required to find and develop resources in the more challenging environments. Too many others already have the cash to deal with the easier prospects.

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<sup>13</sup> Harvard University cited the role of CNPC in Sudan as the reason for the decision in April 2005 to divest its stockholdings of PetroChina. Some western companies have withdrawn from Sudan in recent years. Their place has been taken by others including India's national oil company and Petronas.

<sup>14</sup> In 2004, the governments of Iran and China signed an agreement to develop the Yadavaran field in Iran and for purchases of crude and LNG. Sinopec was designated as contractor for development of the field. As of early 2006, Iran and Sinopec have not yet reached agreement on the development plan for the field.