



Date: June 11, 2024

To: Mayor and Members of the City Council
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CC: Tom Modica, City Manager
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From: Laura Doud, City Auditor

Subject: Climate Transition Impact Review to Prepare for Long Beach's Transition from Fossil Fuel Production and Preserve Critical Infrastructure and City Services

In May 2023, the Long Beach City Council requested a comprehensive review of fiscal liabilities and economic impacts to the City of Long Beach (City) stemming from the State of California's (State's) anticipated transition away from crude oil and natural gas production. Please find attached the Review of Economic Impacts to the City of Long Beach Associated with California's Anticipated Transition Away from Crude Oil and Natural Gas Production conducted by Tom Walker of Evans & Walker, Consulting Petroleum Engineers ("consultant"), on behalf of the City Auditor's Office (Office).

The City derives revenue from oil and gas operations, with over 2,700 active and idle wells in the City from 14 oil operators and operations. This review sought to inventory these oil operators, quantify the current and forecasted City revenues from oil operations, estimate the asset retirement obligations (AROs) and estimate the impact of the loss of oil revenues on City services and programs. This memo summarizes the key findings of the consultant's 25-page report.

Declining Oil Production in the City

In October 2021, a staff report noted the City is significantly reducing its reliance on revenue from oil production due to natural oil production declines of six percent annually. This decline is expected to continue until about 2035, when it is projected that the oil field may generally cease production for economic reasons.

In addition to a decline in oil production and oil revenue, there are costs associated with abandoning oil wells to protect against environmental impacts. In December 2022, a staff report noted that the City projected contributions of \$8.75M annually towards building an abandonment reserve, with an existing reserve of \$70M and projected an additional \$84M cost. This staff report included projections and forecasts on future oil revenue, however it did not include revenues from various taxes due to difficulties in isolating amounts specific to oil production.

The attached consultant report incorporates a comprehensive review and forecast of all oil revenue, including various tax revenues generated specifically from oil production.

California Senate Bill 1137

In September 2022, Governor Gavin Newsom signed California Senate Bill 1137 (SB1137) into law. SB1137 seeks to protect the public health of California's frontline communities by introducing a 3,200-foot distance between residences, schools, playgrounds, hospitals, and nursing homes from an oil and gas production well. This bill prohibits the issuance of well permits and the construction and operation of new oil production facilities within this health protection zone, and it also establishes strict engineering controls to be implemented by existing operations within the zone. SB1137 has been temporarily held pending a referendum vote in the November 2024 elections.

The impact of SB1137 is significant to the City as about half the wells in Long Beach are located within this health protection zone. According to the December 2022 staff report, SB1137 presents major fiscal challenges and will significantly reduce oil production and oil revenue even before the previously projected 2035 date, impacting the Tidelands Operating and Uplands Oil Funds, as well as the General Fund.

Review Methodology

The consultant utilized a methodology which incorporates a complete list of active oil wells in the City, oil production numbers for each well, oil and gas price, calculations for various taxes and assessments including the following:

1. **Mineral Interest Ownership**: The City receives revenue related to oil production for wells operated on land that was transferred from the State to the City in the early 20th century.
2. **Land and Pipeline Franchise Fees**: Fees paid by oil operators for the surface rental of City property and the use of pipelines in oilfield properties.
3. **Overhead**: Charges incurred by City staff, which can be charged back to oil operators.
4. **Taxes (User Utility, Proposition H (Prop H), Ad Valorem Property, General Purpose (Measure US, Sales)**: Various taxes that are assessed on oil production (Prop H and Measure US), use of natural gas and electricity as part of the oil production process, property tax assessed on the fair market value of gas produced, and an additional sales tax for purchases by CRC, an independent oil operator.
5. **Reclaimed Water Sales**: Use of reclaimed water as injection water to mitigate subsidence.
6. **Well Permit Fees**: The City assesses a permit fee of \$380 per year for the first well and \$72 per year for each additional well.

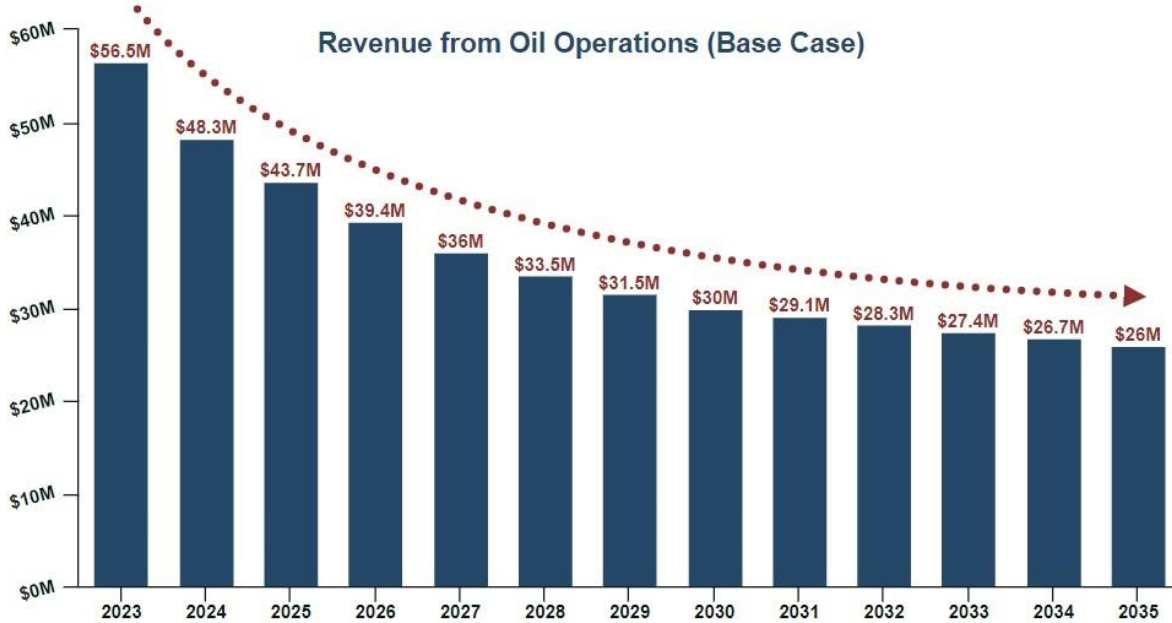
The report forecasts future amounts utilizing data to determine the impact of SB1137 on existing oil production and operations in the City and provides a more accurate understanding of future AROs faced by the City and the State.

The City Faces a Projected \$301M Total Decrease in Oil Revenue by 2035 Due to Production Decline and the Potential Passage of SB1137

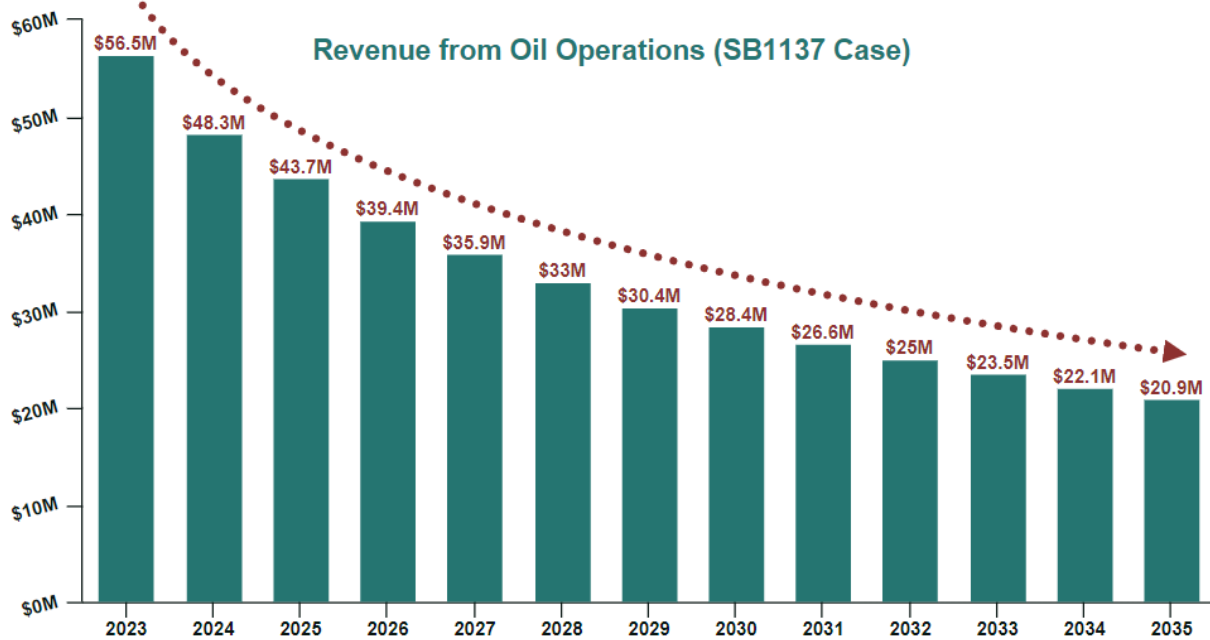
In calendar year 2023 the total oil revenue generated was over \$56M. The consultant's report forecasts a 54% decrease in revenue to \$26M by 2035 due to oil production decline, and a 63% revenue decline to \$21M by 2035 with the potential passage of SB1137. In total, the City's

cumulative revenue decrease from declining oil production amounts to \$279M from 2024 through 2035, increasing to \$301M if SB1137 passes.

Forecasts Show a 54% to 63% Decline in Oil Revenue by 2035, with a Cumulative Revenue Decrease from \$279M to \$301M by 2035



Year	Base Case Using 2023 Baseline Revenue	
	Annual Deficit	Cumulative Revenue Deficit
2024	\$ (8,266,911)	\$ (8,266,911)
2025	\$ (12,832,385)	\$ (21,099,296)
2026	\$ (17,176,866)	\$ (38,276,162)
2027	\$ (20,552,720)	\$ (58,828,882)
2028	\$ (23,026,769)	\$ (81,855,651)
2029	\$ (25,091,402)	\$ (106,947,053)
2030	\$ (26,510,496)	\$ (133,457,549)
2031	\$ (27,464,086)	\$ (160,921,636)
2032	\$ (28,244,923)	\$ (189,166,559)
2033	\$ (29,099,359)	\$ (218,265,918)
2034	\$ (29,867,100)	\$ (248,133,018)
2035	\$ (30,546,494)	\$ (278,679,512)



Year	SB1137 Case Using 2023 Baseline Revenue	
	Annual Deficit	Cumulative Revenue Deficit
2024	\$ (8,269,280)	\$ (8,269,280)
2025	\$ (12,834,439)	\$ (21,103,719)
2026	\$ (17,178,647)	\$ (38,282,366)
2027	\$ (20,692,330)	\$ (58,974,696)
2028	\$ (23,532,248)	\$ (82,506,944)
2029	\$ (26,120,920)	\$ (108,627,864)
2030	\$ (28,190,813)	\$ (136,818,678)
2031	\$ (29,900,654)	\$ (166,719,332)
2032	\$ (31,500,210)	\$ (198,219,542)
2033	\$ (33,092,920)	\$ (231,312,462)
2034	\$ (34,467,859)	\$ (265,780,321)
2035	\$ (35,633,883)	\$ (301,414,204)

The City is Projected to Sufficiently Cover Asset Retirement Obligations, While the State's Abandonment Reserve Contribution is Insufficient to Cover Its Share of Obligations

Accelerating the end of oil and gas operations in the City will also accelerate the need to plug and abandon the wells and facilities used in these operations. The City currently contributes \$8.75M annually and may increase this contribution in years that the Wilmington oil price exceeds the price used to set the City budget. Maintaining this level of funding should build the City abandonment reserves sufficiently to cover City AROs by the end of 2035.

The State has the largest share of AROs associated with oil and gas operations in the City. The State is currently transferring 50% of their net oil operation revenue into their asset retirement

reserve fund, capped at \$2M monthly. Maintaining this level of funding will not build the State abandonment reserves sufficiently to cover State AROs by the end of 2035, with the State's portion of the abandonment costs projected to only be 50% funded. Even if the State were to increase their contribution to 100%, the projected reserve would only be 68% funded by 2035.

Impact on City Services, Programs and Projects

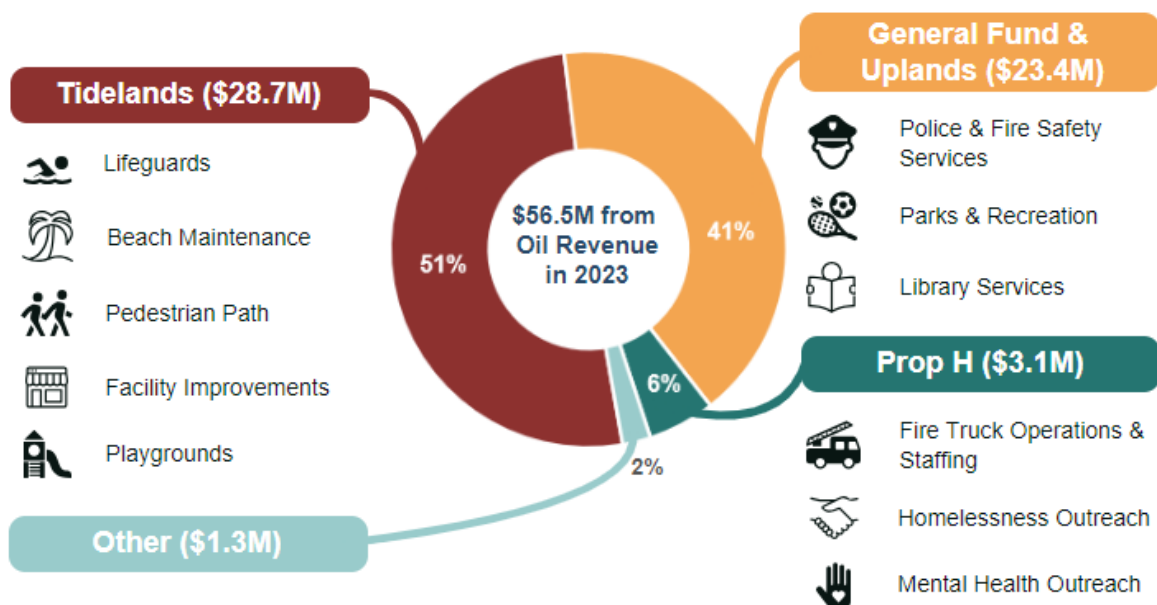
Oil revenue funds the following:

1. Tidelands (51% of annual oil revenue)
2. General Fund and Uplands (41% of annual oil revenue)
3. Prop H (6% of annual oil revenue)
4. Other (2% of annual oil revenue)

These funds are vital in safeguarding the environment, improving infrastructure, enhancing beaches, and keeping residents and visitors safe. Oil revenue has a long history of funding significant infrastructure improvements and vital safety services to Long Beach's waterfront in the Tidelands area. My Office's Harbor Initiative Impact Summary report highlights major projects and services funded by Tidelands funds including bluff improvements, a 3-mile shoreline walking path, ADA beach mobility mats, Colorado Lagoon restoration, playgrounds, sand berms, clearing storm debris, and year-round lifeguard beach patrol. Additionally, Prop H revenue helps fund public safety. My Office's Prop H impact report provides additional detail on public safety initiatives funded by this additional tax on oil production including homelessness outreach and assistance, mental health services, and life-saving fire operations.

The oil revenue is also crucial to General Fund operations, a significant portion of which directly funds public safety. The General Fund is used by the City for numerous operating expenses, from maintenance of trees and parks, to library services, and helping the City's homeless population.

Oil Revenue in 2023 Totaling \$56.5M Helped Fund Essential City Services



Conclusion

With the declining trend in oil production, the City must develop and execute alternative strategies and opportunities over the next decade to bridge the anticipated \$301M revenue shortfall. The City needs to plan accordingly as the revenue shortfall will significantly impact funding for capital projects, public safety operations, and all other essential City services that residents rely upon.

ATTACHMENTS

Review of Economic Impacts to the City of Long Beach Associated with California's Anticipated Transition Away from Crude Oil and Natural Gas Production



Thomas Walker
Evans & Walker

June 11, 2024

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Appendix D	Revenue Implications of SB 1137 - Health and Safety Setbacks Around New and Reworked Existing Oil Wells (COLB Memo dated December 9, 2022)

Introduction

On May 23, 2023, the Long Beach City Council requested the Long Beach City Auditor to conduct a comprehensive review of fiscal liabilities and economic impacts to the City of Long Beach (COLB) stemming from California’s anticipated transition away from crude oil and natural gas production. The City Auditor’s Office contracted with Tom Walker of Evans & Walker, Consulting Petroleum Engineers to perform this review. This report has been prepared to summarize the projected City revenue associated with oil and gas operations in the COLB, and the asset retirement obligations associated with COLB ownership in oil operations in the COLB.

California Senate Bill 1137 (SB 1137) was passed during the 2022 legislative session. This bill included a section stating that, commencing January 1, 2023, the state will no longer approve new wells or the rework of existing wells within a health protection zone. This bill was placed on hold until the voters of California have the opportunity to uphold the bill or reject the bill in the November 5, 2024 election. This bill, if upheld, will have a significant negative impact on oil operations in Long Beach, particularly in those fields that have actively managed waterfloods. This report includes two sets of figures, one if SB 1137 is not upheld (Base Case), and the other if SB 1137 is upheld (SB 1137 case).

Summary

COLB derives a significant amount of revenue from oil and gas operations in and adjacent to COLB. This revenue is and will be generated by the following oil operators and operations located in the COLB:

Figure 1

Oil Operators in the City of Long Beach	
Arrowhead Operating, Inc.	Synergy Oil & Gas LLC
California Resources Long Beach, Inc.	The Landsale Company
E&T Limited Liability Corporation	The Termo Company
Herley-Kelley LLC	THUMS
P&M Oil Company	Tidelands
S&C Oil Company	TJ Scott Family Investments
Signal Hill Petroleum	Warren E&P, Inc.

The only oilfield service providers that are domiciled in the City of Long Beach are CW industries, Petros Tubular Services and Patriot Environmental Services. These firms can remain in business for the foreseeable future as their services will be needed during the lengthy period required to support post-production injection and complete all asset retirement obligations associated with the 2,762 active and idle wells located within the City of Long Beach.

If oil operations continue through 2035, COLB revenue from oil and gas operations (net of the abandonment reserve) is projected as follows:

Figure 2A

City of Long Beach - Revenue from Oil Operations - Base Case			
Year	Revenue	Deficit (2023 Baseline)	Cumulative Loss of Revenue
2022	\$ 68,821,432		
2023	\$ 56,544,471		
2024	\$ 48,277,560	\$ (8,266,911)	\$ (8,266,911)
2025	\$ 43,712,086	\$ (12,832,385)	\$ (21,099,296)
2026	\$ 39,367,605	\$ (17,176,866)	\$ (38,276,161)
2027	\$ 35,991,750	\$ (20,552,720)	\$ (58,828,882)
2028	\$ 33,517,701	\$ (23,026,769)	\$ (81,855,651)
2029	\$ 31,453,069	\$ (25,091,402)	\$ (106,947,053)
2030	\$ 30,033,975	\$ (26,510,496)	\$ (133,457,549)
2031	\$ 29,080,385	\$ (27,464,086)	\$ (160,921,636)
2032	\$ 28,299,547	\$ (28,244,923)	\$ (189,166,559)
2033	\$ 27,445,112	\$ (29,099,359)	\$ (218,265,918)
2034	\$ 26,677,371	\$ (29,867,100)	\$ (248,133,018)
2035	\$ 25,997,977	\$ (30,546,494)	\$ (278,679,512)

Figure 2B

City of Long Beach - Revenue from Oil Operations - SB 1137 Case			
Year	Revenue	Deficit (2023 Baseline)	Cumulative Loss of Revenue
2022	\$ 68,821,432		
2023	\$ 56,544,471		
2024	\$ 48,275,191	\$ (8,269,280)	\$ (8,269,280)
2025	\$ 43,710,032	\$ (12,834,439)	\$ (21,103,719)
2026	\$ 39,365,823	\$ (17,178,647)	\$ (38,282,366)
2027	\$ 35,852,140	\$ (20,692,330)	\$ (58,974,697)
2028	\$ 33,012,223	\$ (23,532,248)	\$ (82,506,944)
2029	\$ 30,423,551	\$ (26,120,920)	\$ (108,627,864)
2030	\$ 28,353,657	\$ (28,190,813)	\$ (136,818,678)
2031	\$ 26,643,817	\$ (29,900,654)	\$ (166,719,332)
2032	\$ 25,044,260	\$ (31,500,210)	\$ (198,219,542)
2033	\$ 23,451,551	\$ (33,092,920)	\$ (231,312,462)
2034	\$ 22,076,612	\$ (34,467,859)	\$ (265,780,322)
2035	\$ 20,910,588	\$ (35,633,883)	\$ (301,414,204)

The 2023 COLB revenue from oil operations of \$56,544,471 is derived from the following sources:

Figure 3

2023 City of Long Beach Revenue from Oil Operations	
Source	Revenue
City Ownership of Oil and Gas Minerals	\$ 34,169,748
Land & Pipeline (Franchise Fee) Payments	\$ 8,373,811
Overhead Payments	\$ 6,433,538
Utility Users Tax Receipts	\$ 5,627,878
Proposition H Tax Receipts	\$ 3,114,301
Ad Valorem (Property) Tax Receipts	\$ 2,950,056
General Purpose Tax Receipts	\$ 2,870,028
Reclaimed Water Sales	\$ 1,087,845
Sales Tax	\$ 425,000
Well Permit Fees	\$ 242,266
Transfer to COLB Asset Retirement Reserve	\$ (8,750,000)
Total	\$ 56,544,471

Accelerating the end of oil and gas operations in the COLB will also accelerate the need to plug and abandon the wells and facilities used in these operations. The State of California has the largest share of the asset retirement obligations (AROs) associated with oil and gas operations in COLB through their ownership in the THUMS Long Beach Unit (LBU) and Tidelands. COLB is also responsible for a meaningful portion of the asset retirement obligations associated with operations at the Signal Hill Petroleum (SHP), Signal Hill East Unit (SHEU), E&T Limited Liability Corporation lease, LBU, and Tidelands. The remainder of the asset retirement obligations are the responsibility of the various operators and the individual town lot owners in the LBU (see Figure 25 on page 21).

COLB is currently transferring \$593,750 each month into the Tidelands asset retirement reserve fund and \$135,417 each month into the Uplands asset retirement reserve fund. This equates to a total annual contribution of \$8,750,000. COLB may increase this contribution in years that the Wilmington oil price exceeds the price used to set the city budget. Maintaining this level of funding should build the city abandonment reserves sufficiently to cover city AROs by the end of 2035.

Figure 4

City of Long Beach - Asset Retirement Obligations				
Date	Obligations	Reserves	Deficit	Reserves as % of Obligations
01/01/24	162,467,271	81,276,000	(81,191,271)	50%
12/31/35	205,320,883	240,770,994	35,450,112	117%

Passage of SB 1137 will not decrease COLB revenue from oil operations in the City below \$8,750,000 prior to the end of 2035, allowing the City to continue making an annual contribution of \$8,750,000 through the end of 2035.

The State of California is currently transferring 50% of their net revenue from THUMS – LBU and Tidelands operations (up to \$2,000,000) each month into the asset retirement reserve fund. Maintaining this level

of funding will not build the state abandonment reserves sufficiently to cover state AROs by the end of 2035.

Figure 5

Asset Retirement Obligations with Reserves with State Contributions at 50% Net Revenue				
Date	Obligations	Reserves	Deficit	Reserves as % of Obligations
01/01/24	1,021,915,631	329,959,955	(691,955,676)	32%
12/31/2035 (Base)	1,390,241,298	689,793,404	(700,447,895)	50%
12/31/2035 (SB 1137)	1,390,241,298	677,871,654	(712,369,645)	49%

Permanently increasing the contributions to 100% of their net revenue (with no upper limit) would reduce but not eliminate the deficit by the end of 2035.

Figure 6

Asset Retirement Obligations with Reserves with State Contributions at 100% Net Revenue				
Date	Obligations	Reserves	Deficit	Reserves as % of Obligations
01/01/24	1,021,915,631	329,959,955	(691,955,676)	32%
12/31/2035 (Base)	1,390,241,298	948,049,574	(442,191,724)	68%
12/31/2035 (SB 1137)	1,390,241,298	924,192,716	(466,048,582)	66%

Methodology

This was not an audit conducted in accordance with Generally Accepted Government Auditing Standards, but rather a limited scope review to forecast oil revenue and asset retirement obligations. Had we performed an audit, other matters might have come to our attention that would have been reported.

Revenue Sources

The first step in the review process was the creation of a complete list of revenue sources related to oil and gas production in the City of Long Beach (COLB). The primary source of information on these revenue sources was a memo entitled “The Flow of Revenues from Oil Operations in the City of Long Beach” prepared by Kevin Tougas of the City of Long Beach Energy Resources Department (LBER) in 2014. A copy of this memo is attached as Appendix A. Based on this memo and discussions with the COLB, LBER provided copies of Excel workbooks summarizing the recent revenue associated with miscellaneous payments, land and pipeline rental payments, payments associated with COLB mineral interest ownership, and overhead payments. Additionally, COLB provided copies of the revenue check detail statements for approximately the past 12 months from CRC Long Beach, Inc, E&T Limited Liability Company (E&T LLC), SHP, Synergy Oil & Gas, LLC. associated with COLB ownership of mineral interests. The final documents reviewed to complete the list of revenue sources were the Optimized Waterflood Program Agreement (OWPA) statements for the last 12 months for THUMS – LBU, Tidelands (POLB Ownership), Tidelands (State Ownership), and Tidelands (Uplands).

Well List

The next step in the review process was the creation of a complete list of oil and gas wells and water injection and disposal wells located within the COLB. The California Department of Conservation – Geologic Energy Management Division (CalGEM) is the agency charged with regulating oil and gas operations in California. CalGEM maintains a web site that maps all the oil and gas wells and water injection and disposal wells in the state (<https://maps.conservation.ca.gov/doggr/wellfinder/>). Data from this site was compared to the boundary of the City of Long Beach found on the Google Maps site (<https://www.google.com/maps/>) to develop a list of the 2,761 active and idle oil and gas wells and water injection and disposal wells in the City of Long Beach. This well list was instrumental in the forecasting of future well permit fees paid to the COLB.

Production

Much of the oil and gas revenue paid to the City of Long Beach is a function of the oil and water production from these wells. The third step in the review process was the creation of a database of historical and forecast monthly oil and water production from these wells. Long Beach Energy Resources (LBER) provided production data for the THUMS – LBU and Tidelands operations. Production data for the LBU was provided on a unit wide basis, and production from Tidelands was provided on a city-wide basis (a portion of the wells in Tidelands are located within the City of Los Angeles). Monthly production data for the remaining wells was sourced from the CalGEM web site that contains production data reported to the state by the various well operators (<https://wellstar-public.conservation.ca.gov/>). This monthly production data was uploaded into an oil and gas software package for decline curve analysis. This software package analyzed the historical production data and forecasted future production based on decline curve analysis. Future production was forecast on a well-by-well basis for all operations other than SHEU, Signal Hill West Unit

(SHWU), THUMS LBU, and Tidelands. Production from the SHEU, SHWU, and THUMS LBU was forecast on a unit basis. Production from the Tidelands operation was forecast on a city-wide basis. Plots of historical and forecast production for various wells and units in COLB are attached as Appendix B.

Oil Price

Forecasts of future COLB revenue associated with ad valorem taxes and mineral interest ownership required forecasts of future oil and gas prices. Future oil prices were forecast based on Brent North Sea futures prices seen at the close of trading on each Wednesday in December 2023. A review of Brent North Sea spot prices found that the Wilmington posted crude oil price averaged \$10.39 per barrel below Brent prices from November 2022 through October 2023. North Sea futures prices from December 2023 were adjusted downwards by \$10.39 to develop a forecast of Wilmington prices. This process yielded an estimate of the January 2024 price of \$66.81. This process indicates that Wilmington prices will gradually decrease to \$57.57 by March 2031 (last month of Brent North Sea futures contracts) and remain at this price going forward. COLB and LBER provided revenue statements for the various mineral interest holdings of the city. Analysis of these statements allowed for a further adjustment of Wilmington prices to account for actual prices received for the mineral interest holdings of the city. A plot of historical and forecast Brent North Sea and Wilmington oil prices is included as Exhibit 1.

Gas Price

Most oil operators in the city burn the produced gas to generate heat or electricity for use in production operations. There are a few exceptions, one being Synergy Oil & Gas LLC. Synergy operates the Recreation Park lease in which the city owns an 18.00% royalty interest. Future gas prices for the Recreation Park lease were forecast based on Henry Hub futures prices seen at the close of trading on each Wednesday in December 2023. A review of Henry Hub spot prices found that the Recreation Park gas prices averaged \$0.26 per MCF below Henry Hub prices from November 2022 through October 2023. Henry Hub futures prices from December 2023 were adjusted downwards by \$0.26 per MCF to develop a forecast of Recreation Park prices. This process yielded an estimate of the January 2024 price of \$2.21 per MCF. This process indicates that Recreation Park prices will gradually increase to \$4.11 per MCF by December 2036 (last month of Henry Hub futures contracts) and remain at this price going forward. A plot of historical and future Henry Hub and Recreation Park natural gas prices is included as Exhibit 2. Natural gas revenue (if any) association with any other operations in the city was included with oil revenue and incorporated into the analysis of actual prices received for the other mineral interest holdings of the city.

Operating Expenses

COLB receives overhead on the operating expenses for the THUMS LBU operation and for the Tidelands operations. COLB also received a 5% Utility Users Tax (UUT) on the electricity bills for oil well operations in the city. Therefore, forecasting future COLB revenue from oil operations also requires knowledge of historical and future operating expenses. The various OWPA statements included historical operating expense data for the THUMS LBU and Tidelands operations. The joint interest bills for the COLB working interest in the SHEU also included historical operating expense data for the SHEU. This data was compared to historical oil production data to calculate operating expenses on a dollars per barrel of oil production basis for THUMS LBU, the various Tidelands operations, and the SHEU. Operating expenses for the other operations in the city were assumed to average \$25 per barrel of oil production. Future operating expenses for oil and gas operations in the city were estimated by multiplying the previously mentioned forecasts of future oil production by these calculated or estimated levels of operating expenses.

Taxes and Assessments

Oil and gas production in the city is subject to several taxes. These taxes include the COLB General Purpose Tax as adjusted by Measure US of \$0.340 per barrel of oil, the COLB Proposition H Tax of \$0.369 per barrel of oil, the CalGEM assessment that is currently \$1.011 per barrel, and the ad valorem (property) tax which is roughly 1% of assessed value of a producing property. The General Purpose and Proposition H tax rates are assumed to increase each June 1st based on average annual increase in the Consumer Price Index for All Urban Consumers (CPI-U) for Los Angeles – Long Beach – Anaheim, California from 2012-13 through 2022-23 as published by the United State Bureau of Labor Statistics. The CalGEM assessment rate is established by CalGEM in June of each year and is based on CalGEM's estimated budget for the ensuing fiscal year and the total amount of assessable oil and gas produced during the prior calendar year. California oil production has declined at a rate of 6.7% per year for the past nine years. California has also imposed a significant number of new regulations during this time, resulting in a steady increase in the annual assessment rate. The CalGEM assessment is forecast to increase at a rate of 10% per year given this information. The various Tidelands OWPAs included historical ad valorem tax data for the Tidelands operations. Analysis of these statements indicated that the average ad valorem payment averaged 2.73% of gross revenue. This review assumed that the Tidelands ad valorem tax payments will continue to average 2.73% of gross revenue. This review made the conservative assumption that ad valorem tax payments for the other operations in the city will average 2.00% of gross revenue.

Impact of Implementation of Senate Bill 1137

As stated earlier, SB 1137 will preclude the state from approving new wells or the rework of existing wells within a health protection zone. A majority of the City of Long Beach meets the definition of a health protection zone. This bill, if upheld, will therefore have a significant negative impact on oil operations in Long Beach, particularly in those fields that have actively managed waterfloods. The largest impact of the bill would therefore be on assets operated by THUMS LBU and Tidelands. There would be some de-minimis impact on the Signal Hill East Unit and Signal Hill West Unit, but these impacts pale in magnitude to the impacts on THUMS LBU and Tidelands operations and were therefore outside of the scope of this review.

A COLB Memo entitled “Revenue Implications of SB 1137 - Health and Safety Setbacks Around New and Reworked Existing Oil Wells” dated December 9, 2022 indicates that the long-term natural field decline in oil production experienced in the City’s oil fields will increase from 6% per year to 12% per year. A copy of this memo is attached as Appendix D. This review found that the historical West Wilmington field decline rate was 5.85%, effectively the same as the 6% decline rate mentioned in the memo. Should SB 1137 be upheld in the November 5, 2024 general election, implementation of the bill will likely follow on or about January 1, 2025.

This review modeled the impact of implementation of SB 1137 by assuming a gradual increase in the annual field decline in oil production from 5.85% per year to 11.85% per year. This is the same 6% increase forecast by LBER in the December 9, 2022 COLB Memo. THUMS LBU and Tidelands should have a small backlog of permitted work that should allow them to maintain the 5.85% decline rate through the end of 2026. It is my professional opinion that oil production will not immediately drop by 6%, rather production will gradually drop over time as the backlog of permitted work is eliminated.

This review forecasts a 1% increase in the annual decline rate each year until the terminal rate of 11.85% is reached at the start of 2032. A gradual increase in the annual field decline in water production from 1.1% per year to 4.1% per year is also forecast to occur with the implementation of SB 1137. The 1.1%

decline rate is forecast to hold steady through the end of 2026. This review forecasts a 0.5% increase in the annual decline rate each year until the terminal rate of 4.1% is reached at the start of 2032. The original and revised forecasts of oil and water production for THUMS LBU and Tidelands are shown as Exhibits 32A-B and 33A-B in Appendix B. The revised forecasts were incorporated into the previously described models to generate a revised forecast of COLB revenue from oil operations in the West Wilmington field.

Forecasts of COLB Revenue

Mineral Interest Ownership

Forecasts of future COLB revenue associated with mineral interest ownership required the preparation of a detailed list of mineral interests owned by COLB. A review of the documents provided by COLB and LBER led to the following list of COLB mineral interests:

Figure 7

Operator	Asset	Working Interest	Revenue Interest
CRLBI	S1C	-	0.01435080
CRLBI	WPU N1C TR2	-	0.00086624
CRLBI	N1C	-	0.00286500
CRLBI	N3C	-	0.00120610
CRLBI	WPU S1C TR1	-	0.00354683
E&T LLC	E&T 8	-	0.03500000
E&T LLC	E&T 9	-	0.03500000
E&T LLC	E&T 12	-	0.03500000
E&T LLC	E&T 17	-	0.03500000
SHP	TC 1	-	0.02500000
SHP	B 302	-	0.16666666
SHP	Cherry Hills 10	-	0.05103340
SHP	SHEU	0.09754240	0.09754240
SHP	SHWU	-	0.02989178
SHP	Long Beach Airport C 37	-	0.16666667
Synergy O&G	Recreation Park	-	0.18000000
THUMS	Belmont Offshore	-	0.02500000
THUMS	Long Beach Unit	0.07818570	0.07818570
THUMS	LBU - Townlot Participation	0.00909267	0.00683675
Tidelands	Port of Long Beach Ownership	0.30701551	0.30701551
Tidelands	State of California Ownership	0.63048050	0.63048050
Tidelands	Uplands	0.05525319	0.05525319
Tidelands	Other	0.00725080	0.00725080

The city also holds a carried working interest in the Recreation Park lease and a carried working interest of 0.39231800 in the E&T LLC wells 2, 3, 4, 6, 7, 15, and 16. The E&T LLC carried interests have a negative balance of \$70,000 and are generating an additional loss of about \$1,000 per month. These wells produce less than 8 barrels of oil per day, and revenue from these wells will not recover the negative balance of \$70,000. The city will not be responsible for this negative balance, but the city will also not see any future revenue from these interests. This negative balance is immaterial and further review of this carried interest is beyond the scope of this review. Abandonment liability for these wells is discussed later in this review.

This list of mineral interest ownership was combined with the previously discussed forecasts of production, price, operating expenses, and taxes to generate an estimate of future COLB cash flow for each of these mineral interests. The forecast of future revenue was compared to historical revenue as found in Excel workbooks provided by LBER. This historical data was available for 2022 and the first six – nine months of

2023. Full year 2023 data was obtained by multiplying the average of the available monthly revenue by 12. The forecast of COLB mineral interest ownership revenue through 2035 is as follows:

Figure 8

City of Long Beach Revenue from Ownership of Oil and Gas Minerals		
Year	Revenue, Base Case	Revenue, SB 1137 Case
2022	\$ 46,657,917	\$ 46,657,917
2023	\$ 34,169,748	\$ 34,169,748
2024	\$ 26,117,159	\$ 26,116,068
2025	\$ 22,239,694	\$ 22,238,850
2026	\$ 18,405,347	\$ 18,404,714
2027	\$ 15,461,387	\$ 15,394,816
2028	\$ 13,308,050	\$ 13,079,825
2029	\$ 11,598,778	\$ 11,159,618
2030	\$ 10,436,415	\$ 9,749,504
2031	\$ 9,691,020	\$ 8,719,694
2032	\$ 9,044,591	\$ 7,779,645
2033	\$ 8,372,122	\$ 6,862,864
2034	\$ 7,714,659	\$ 6,027,798
2035	\$ 7,115,370	\$ 5,310,690

Land and Pipeline (Franchise Fee) Payments

The Excel workbooks provided by LBER included information on recent Land and Pipeline (Franchise Fee) payments. The land payments (~ 70% of total) relate to the surface rental of City (Harbor Department) land for oil operations. The pipeline payments (~ 30% of total) relate to the franchise fees associated with the pipelines used in oilfield operations. Payment amounts are detailed in a series of Harbor Department Resolutions (land) and Pipeline Licenses (pipelines). The Natural Gas Delivery and Purchase Agreement for Unit Gas dated March 1, 2011 was grouped with Pipeline Licenses for purposes of this review. The Harbor Department Resolutions typically call for an annual increase in rental rates based on the Consumer Price Index for All Urban Consumers (CPI-U) for Los Angeles – Long Beach – Anaheim, California. The Pipeline Licenses link the payments to the current charges for the use of unpaved City-owned land as prescribed in Port of Long Beach Tariff #4. This review assumed that both the land rental rates, and Tariff #4 fees will increase at a rate equal to the average annual increase in the Consumer Price Index for All Urban Consumers (CPI-U) for Los Angeles – Long Beach – Anaheim, California from 2012-13 through 2022-23 as published by the United State Bureau of Labor Statistics, or 3.02%.

California Resources Corporation (CRC), the contract operator for LBER for THUMS LBU, constructed a power plant to self-generate a portion of the electricity needed to power THUMS LBU operations. CRC has an agreement with COLB to pay the estimated UUT and Franchise Fees associated with operation of the power plant. LBERD provided copies of the calculations of these “make-whole” payments from July 2022 through June 2023. Future THUMS LBU franchise fee “make-whole” payments, which were based on these historical payments, are forecast to be \$32,160 per month.

The forecast of franchise fees through 2035 is as follows:

Figure 9

City of Long Beach Revenue from Land & Pipeline (Franchise Fee) Payments		
Year	Revenue, Base Case	Revenue, SB 1137 Case
2022	\$ 7,884,343	\$ 7,884,343
2023	\$ 8,373,811	\$ 8,373,811
2024	\$ 9,229,814	\$ 9,229,814
2025	\$ 9,442,590	\$ 9,442,590
2026	\$ 9,661,790	\$ 9,661,790
2027	\$ 9,887,606	\$ 9,887,606
2028	\$ 10,120,239	\$ 10,120,239
2029	\$ 10,359,894	\$ 10,359,894
2030	\$ 10,606,783	\$ 10,606,783
2031	\$ 10,861,126	\$ 10,861,126
2032	\$ 11,123,145	\$ 11,123,145
2033	\$ 11,393,074	\$ 11,393,074
2034	\$ 11,671,152	\$ 11,671,152
2035	\$ 11,957,623	\$ 11,957,623

Passage of SB 1137 will not change COLB revenue from land and pipeline (Franchise Fee) payments as these payments are set by contract and are not a function of oil production.

Overhead Payments

The Unit Agreements governing Tidelands and THUMS LBU state that some staff positions can be charged as a Unit expense. In practice, LBER has not charged for staff at the Bureau Manager level or higher. Administrative overhead is designed to pay for that staff time as well as Director, City Manager, Mayor, and others that would devote only a portion of their time to the operations. Administrative Overhead is calculated as a percentage of total expense (excluding taxes, litigation, and water injection). For the Belmont offshore lease, California Resources Corporation requested and received permission to utilize part of one of the Long Beach Unit drilling islands to conduct drilling operations to produce their lease in the Belmont Offshore field. The THUMS LBU Administrative Overhead therefore applies to their Belmont Offshore operations. The forecasts of overhead payments to COLB are based on the following contractually mandated overhead rates.

Figure 10

City of Long Beach Overhead Rates		
Operator	Asset	Overhead %
THUMS	Belmont Offshore	1%
THUMS	Long Beach Unit	1%
Tidelands	All	4%

Forecasts of future COLB revenue associated with overhead payments were made using these overhead rates and the previously described forecasts of future operating expenses for these assets. The forecast of future revenue from overhead payments was compared to historical revenue as found in the Excel workbooks provided by LBER. This historical data was available for 2022 and the first six – nine months of 2023. Full year 2023 data was obtained by multiplying the average of the available monthly revenue by 12. The forecast of overhead payments to the city through 2035 is as follows:

Figure 11

City of Long Beach Revenue from Overhead Payments		
Year	Revenue, Base Case	Revenue, SB 1137 Case
2022	\$ 6,281,829	\$ 6,281,829
2023	\$ 6,433,538	\$ 6,433,538
2024	\$ 6,040,648	\$ 6,040,236
2025	\$ 5,683,445	\$ 5,683,058
2026	\$ 5,366,912	\$ 5,366,547
2027	\$ 5,071,955	\$ 5,045,816
2028	\$ 4,809,016	\$ 4,710,935
2029	\$ 4,538,668	\$ 4,332,918
2030	\$ 4,298,829	\$ 3,958,339
2031	\$ 4,075,137	\$ 3,581,955
2032	\$ 3,875,059	\$ 3,217,752
2033	\$ 3,667,550	\$ 2,862,970
2034	\$ 3,482,672	\$ 2,557,455
2035	\$ 3,309,253	\$ 2,287,539

Utility Users Tax

LBERD provided copies of the monthly Southern California Edison (SCE) invoices for California Resources Long Beach, Inc. (CRLBI) and THUMS LBU from September 2022 through August 2023. LBERD provided copies of the SCE invoices for Tidelands from July 2022 through July 2023. California Resources Corporation (CRC), the contract operator for LBERD for THUMS LBU, constructed a power plant to self-generate a portion of the electricity needed to power THUMS LBU operations. CRC has an agreement with COLB to pay the estimated UUT and Franchise Fees associated with operation of the power plant. LBERD provided copies of the calculations of these “make-whole” payments from July 2022 through June 2023. These documents were analyzed in conjunction with the previously mentioned historical production data to generate average electricity costs on a dollars per barrel of liquid (oil plus water) produced basis for CRLBI, THUMS LBU, and Tidelands operations.

LBER does not have access to the SCE invoices for the remaining operators in the city. The average electricity charge per barrel of liquid for CRLBI was used to estimate future electricity charges for these remaining operators as the remaining operations in the city are closer in size to CRLBI operations than to THUMS LBU or Tidelands operations. The forecast of COLB revenue from the UUT was then calculated by multiplying the forecast of liquid (oil plus water) production for each entity and operation by the appropriate electricity charge in dollars per barrel of liquid and then applying the UUT tax rate of 5.0%.

The forecast of future UUT revenue was compared to historical CRLBI, THUMS LBU, and Tidelands UUT revenue as found in the various SCE invoices and “make-whole” payment calculations. Data for months for which the SCE invoices were not available was estimated in the same manner used to forecast future UUT revenue for these entities. Historical UUT revenue for the remaining operators was also estimated using the methodology employed to forecast future UUT revenue from these operators. UUT revenue from CRLBI, THUMS LBU, and Tidelands operations represents more than 93% of the total estimated UUT revenue from 2022 and 2023. The forecast of Utility User Tax revenue through 2035 is as follows:

Figure 12

City of Long Beach Revenue from Utility User Taxes		
Year	Revenue, Base Case	Revenue, SB 1137 Case
2022	\$ 5,455,224	\$ 5,455,224
2023	\$ 5,627,878	\$ 5,627,878
2024	\$ 5,343,903	\$ 5,343,894
2025	\$ 5,245,326	\$ 5,245,317
2026	\$ 5,187,312	\$ 5,187,304
2027	\$ 5,130,209	\$ 5,118,019
2028	\$ 5,087,803	\$ 5,039,540
2029	\$ 5,018,443	\$ 4,911,977
2030	\$ 4,963,881	\$ 4,778,350
2031	\$ 4,910,116	\$ 4,626,592
2032	\$ 4,870,363	\$ 4,470,750
2033	\$ 4,804,756	\$ 4,286,938
2034	\$ 4,753,268	\$ 4,122,955
2035	\$ 4,702,503	\$ 3,966,004

Proposition H Tax

The forecast of COLB revenue from the Proposition H tax was calculated by multiplying the forecast of oil production for each entity and operation by the current tax rate of \$0.369 per barrel of oil . As mentioned earlier, Proposition H tax rates are assumed to increase each June 1st based on average annual increase in the Consumer Price Index for All Urban Consumers (CPI-U) for Los Angeles – Long Beach – Anaheim, California from 2012-13 through 2022-23 as published by the United State Bureau of Labor Statistics. Historical Proposition H taxes were calculated by multiplying actual 2022 and 2023 production by the Proposition H tax rate in effect at the time of production. Production for the last few months of 2023 was taken from the previously mentioned forecasts of future production. The forecast of Proposition H tax revenue through 2035 is as follows:

Figure 13

City of Long Beach Revenue from Proposition H Taxes		
Year	Revenue, Base Case	Revenue, SB 1137 Case
2022	\$ 3,086,146	\$ 3,086,146
2023	\$ 3,114,301	\$ 3,114,301
2024	\$ 3,047,351	\$ 3,047,029
2025	\$ 2,945,161	\$ 2,944,850
2026	\$ 2,861,305	\$ 2,861,003
2027	\$ 2,780,662	\$ 2,767,445
2028	\$ 2,710,001	\$ 2,659,572
2029	\$ 2,627,528	\$ 2,519,179
2030	\$ 2,555,111	\$ 2,371,356
2031	\$ 2,485,133	\$ 2,212,441
2032	\$ 2,423,801	\$ 2,051,544
2033	\$ 2,351,700	\$ 1,885,155
2034	\$ 2,288,443	\$ 1,739,360
2035	\$ 2,227,258	\$ 1,606,980

Ad Valorem Taxes

Ad Valorem taxes were estimated to be 2% of gross revenue for all operations except Tidelands, for which data provided by LBER indicated that ad valorem taxes for this entity averaged 2.73% of gross revenue. Discussions with COLB personnel indicated that the city receives roughly 22% of the total ad valorem tax payments made to the State of California. Forecasts of future COLB revenue associated with ad valorem taxes were made taking 22% of the product of oil production forecasts, price forecasts, and ad valorem tax rates. Historical ad valorem tax revenue was also estimated using the methodology employed to forecast future ad valorem tax revenue. Historical production data (and forecast production data for the last few months of 2023) was multiplied by actual Wilmington oil prices (after application of the appropriate differential), by the forecast ad valorem tax rate, and by the COLB 22% share of ad valorem taxes. The forecast of ad valorem tax revenue through 2035 is as follows:

Figure 14

City of Long Beach Revenue from Ad Valorem Taxes		
Year	Revenue, Base Case	Revenue, SB 1137 Case
2022	\$ 3,730,873	\$ 3,730,873
2023	\$ 2,950,056	\$ 2,950,056
2024	\$ 2,652,879	\$ 2,652,640
2025	\$ 2,373,533	\$ 2,373,318
2026	\$ 2,146,120	\$ 2,145,926
2027	\$ 1,960,617	\$ 1,951,301
2028	\$ 1,812,500	\$ 1,778,485
2029	\$ 1,678,657	\$ 1,608,696
2030	\$ 1,570,428	\$ 1,456,111
2031	\$ 1,480,467	\$ 1,315,884
2032	\$ 1,401,156	\$ 1,182,994
2033	\$ 1,319,100	\$ 1,053,617
2034	\$ 1,245,541	\$ 942,186
2035	\$ 1,176,268	\$ 843,578

General Purpose Taxes

The forecast of COLB revenue from the General Purpose tax was calculated by multiplying the forecast of oil production for each entity and operation by the current tax rate of \$0.34 (increased from \$0.15 per barrel due to the passage of Measure US) per barrel of oil. As mentioned earlier, General Purpose H tax rates are assumed to increase each June 1st based on average annual increase in the Consumer Price Index for All Urban Consumers (CPI-U) for Los Angeles – Long Beach – Anaheim, California from 2012-13 through 2022-23 as published by the United State Bureau of Labor Statistics. Historical General Purpose taxes were calculated by multiplying actual 2022 and 2023 production by the General Purpose tax rate in effect at the time of production. Production for the last few months of 2023 was taken from the previously mentioned forecasts of future production. The forecast of General Purpose tax revenue through 2035 is as follows:

Figure 15

City of Long Beach Revenue from General Purpose Taxes		
Year	Revenue, Base Case	Revenue, SB 1137 Case
2022	\$ 2,845,282	\$ 2,845,282
2023	\$ 2,870,028	\$ 2,870,028
2024	\$ 2,807,857	\$ 2,807,561
2025	\$ 2,713,699	\$ 2,713,411
2026	\$ 2,636,433	\$ 2,636,154
2027	\$ 2,562,127	\$ 2,549,950
2028	\$ 2,497,020	\$ 2,450,555
2029	\$ 2,421,028	\$ 2,321,195
2030	\$ 2,354,302	\$ 2,184,989
2031	\$ 2,289,824	\$ 2,038,563
2032	\$ 2,233,313	\$ 1,890,311
2033	\$ 2,166,878	\$ 1,737,000
2034	\$ 2,108,593	\$ 1,602,663
2035	\$ 2,052,216	\$ 1,480,686

Reclaimed Water Sales

The Board of Water Commissioners of the City of Long Beach entered into an agreement with THUMS Long Beach Company to provide reclaimed water to THUMS LBU for use as injection water to mitigate subsidence on August 1, 1997 (Agreement WD-2204). This 25-year agreement automatically renews for successive periods of five years and is currently in effect through July 31, 2027. Reclaimed water sales to THUMS LBU averaged ~22,350 barrels per day over the past two years. This represents only ~2% of total THUMS LBU water injection during that time. Ongoing production at THUMS LBU will continue through 2035, requiring continued water injection at THUMS LBU. Reclaimed water sales are forecast to remain constant through 2035. The volumetric and daily use charges are assumed to increase each year based on the average annual increase in the CPI (3.02%). In addition, it is forecasted that Reclaimed water will be needed to supply water for post-production injection. Reclaimed water injection volumes are anticipated to be between 20,000 and 35,000 bpd. The forecast of COLB revenue from reclaimed water sales through 2035 is as follows:

Figure 16

City of Long Beach Revenue from Reclaimed Water Sales		
Year	Revenue, Base Case	Revenue, SB 1137 Case
2022	\$ 962,551	\$ 962,551
2023	\$ 1,087,845	\$ 1,087,845
2024	\$ 1,120,683	\$ 1,120,683
2025	\$ 1,154,512	\$ 1,154,512
2026	\$ 1,189,362	\$ 1,189,362
2027	\$ 1,225,265	\$ 1,225,265
2028	\$ 1,262,251	\$ 1,262,251
2029	\$ 1,300,353	\$ 1,300,353
2030	\$ 1,339,606	\$ 1,339,606
2031	\$ 1,380,044	\$ 1,380,044
2032	\$ 1,421,702	\$ 1,421,702
2033	\$ 1,464,618	\$ 1,464,618
2034	\$ 1,508,829	\$ 1,508,829
2035	\$ 1,554,375	\$ 1,554,375

Passage of SB 1137 will not change COLB revenue from reclaimed water sales as these payments are set by contract and are not a function of oil production.

Sales Tax

CRC has a purchasing agreement with the City of Long Beach that provides the COLB with a portion of the sales tax associated with the CRC purchase of items for use by the Unit. The first full year of this agreement was the fiscal year of 2020, and the agreement has generated \$425,000 annually to the COLB since that time. The forecast of COLB revenue from this sales tax agreement through 2035 is as follows:

Figure 17

City of Long Beach Revenue from CRC Sales Tax Agreement		
Year	Revenue, Base Case	Revenue, SB 1137 Case
2022	\$ 425,000	\$ 425,000
2023	\$ 425,000	\$ 425,000
2024	\$ 425,000	\$ 425,000
2025	\$ 425,000	\$ 425,000
2026	\$ 425,000	\$ 425,000
2027	\$ 425,000	\$ 425,000
2028	\$ 425,000	\$ 425,000
2029	\$ 425,000	\$ 425,000
2030	\$ 425,000	\$ 425,000
2031	\$ 425,000	\$ 425,000
2032	\$ 425,000	\$ 425,000
2033	\$ 425,000	\$ 425,000
2034	\$ 425,000	\$ 425,000
2035	\$ 425,000	\$ 425,000

Passage of SB 1137 should not change COLB revenue from the CRC sales tax agreement as any decrease in capital expenditures on downhole work are estimated to be offset by an increase in capital expenditures on surface work.

Well Permit Fees

The COLB Well Permit Fees are \$380 per year for the first well in a facility, and \$72 for each subsequent well in a facility. Fees for THUMS LBU and Tidelands operators were based on historical well permit fee statements. Well permit fees are forecast to remain consistent (no near term well abandonments) except for Tidelands, which abandons roughly 11.5 wells per year. Fees for the remaining operations in the COLB were based on well counts and a rough estimate of the number of facilities present in the COLB. The forecast of COLB revenue from well permit fees through 2035 is as follows:

Figure 18

City of Long Beach Revenue from Well Permit Fees			
Year	Revenue, Base Case		Revenue, SB 1137 Case
2022	\$	242,266	\$ 242,266
2023	\$	242,266	\$ 242,266
2024	\$	242,266	\$ 242,266
2025	\$	239,126	\$ 239,126
2026	\$	238,024	\$ 238,024
2027	\$	236,923	\$ 236,923
2028	\$	235,822	\$ 235,822
2029	\$	234,720	\$ 234,720
2030	\$	233,619	\$ 233,619
2031	\$	232,518	\$ 232,518
2032	\$	231,416	\$ 231,416
2033	\$	230,315	\$ 230,315
2034	\$	229,214	\$ 229,214
2035	\$	228,112	\$ 228,112

Although passage of SB 1137 will severely limit the number of new wells permitted in the City of Long Beach, the bill will not accelerate abandonment of existing active and idle wells in the city. Both active and idle wells require a permit to operate from the City, therefore passage of SB 1137 is not projected to change the number of wells permitted in the City, and will therefore have no impact on well permit fees.

Asset Retirement Obligations

State of California and City of Long Beach

California State Lands Commission (SLC) Staff Report 82 includes a Full Field Abandonment Opinion of Probable Cost of the asset retirement obligations (ARO) of THUMS LBU and Tidelands. A copy of Staff Report 82 is attached as Appendix C. The Opinion of Probable Cost, prepared in late 2017, includes a breakdown of costs between well abandonments and facility demolition / site restoration. The report also stated that these costs are forecast to increase at a rate of 2.8% per year. For the purposes of this review, the late 2017 costs for facility demolition / site restoration were assumed to be accurate as of January 1, 2018 and were escalated at 2.8% per year until the present (January 1, 2024). The resulting facility demolition / site restoration obligations are \$405,991,667 for THUMS LBU and \$195,914,588 for Tidelands.

LBERD provided current average well abandonment costs for THUMS LBU (\$337,225) and Tidelands (\$306,568). LBER also provided information on current well counts for active and idle wells that will eventually need to be abandoned. LBER has not abandoned THUMS LBU wells given the need to maintain well slots on the drilling islands for potential future use. Multiplying the current average well abandonment costs by the current number of active and idle wells yields well abandonment obligations of \$513,256,146 for THUMS LBU and \$232,991,680 for Tidelands.

The city also has AROs associated with the 0.09754240 gross working interest in the SHEU and the 0.39231800 carried working interest in the E&T LLC 2, 3, 4, 6, 7, 15, and 16. The rough estimate of AROs for the SHEU as of January 1, 2024 is \$24,000,000 for well abandonments and an additional \$1,629,880 for facility demolition and site restoration. The city share of this figure is \$2,500,000. The rough estimate of COLB AROs for the E&T LLC wells as of January 1, 2024 is \$841,905 for well abandonments

Figure 19

Asset Retirement Obligations as of January 1, 2024				
Asset	Well Abandonment	Facility Demo &	Total	COLB Share
		Site Restoration		
THUMS	\$ 513,256,146	\$ 405,991,677	\$ 919,247,823	\$ 6,434,735
Tidelands	\$ 232,991,680	\$ 195,914,588	\$ 428,906,268	\$ 152,690,632
SHEU	\$ 24,000,000	\$ 1,629,880	\$ 25,629,880	\$ 2,500,000
E&T LLC (*)	\$ 2,145,976	\$ -	\$ 2,145,976	\$ 841,905
Total	\$ 772,393,802	\$ 603,536,145	\$ 1,375,929,947	\$ 162,467,271

(*) – The ARO of \$2,145,976 only represents the ARO associated with the wells in which the COLB holds the carried working interest of 0.392318.

Discussions with LBER personnel indicated that the split of AROs are as follows:

Figure 20

Allocation of Asset Retirement Obligations as of January 1, 2024			
Asset	State of California	City of Long Beach	Other
THUMS	84.90%	0.70%	14.40%
Tidelands	56.30%	35.60%	8.10%
SHEU	0.00%	9.75%	90.25%

Assuming that these splits are valid and incorporating COLB ownership in the SHEU, current AROs for the state and the city are estimated to be:

Figure 21

Asset Retirement Obligations as of January 1, 2024			
Asset	Well Abandonment	Facility Demolition and Site Restoration	Total
State of CA	\$ 566,928,783	\$ 454,986,847	\$ 1,021,915,631
COLB	\$ 89,720,754	\$ 72,746,518	\$ 162,467,271
Others	\$ 115,744,264	\$ 75,802,781	\$ 191,547,045
Total	\$ 772,393,802	\$ 603,536,145	\$ 1,375,929,947

The 2024 ARO costs for facility demolition / site restoration were escalated at 2.8% per year to estimate ARO costs for surface work as of January 1, 2035. The monthly revenue statements provided by LBER for the various Tidelands assets included information on the number of recent well abandonments. An average of 11.5 Tidelands wells have been abandoned each year over the past few years. There is a finite number of well slots on the THUMS LBU Islands, and THUMS LBU does not abandon to surface any of the wells on the islands to preserve the well slots for potential redrilling operations. Historical abandonment data for Signal Hill Petroleum was not readily available. The current well count for Tidelands was decreased by 11.5 wells per year to reflect the recent level of well abandonments. The current well counts for THUMS LBU and the SHEU were held constant. The 2024 average well abandonment costs were escalated at 2.8% per year and multiplied by the estimated number of active and idle wells remaining as of January 1, 2024 to estimate ARO costs for downhole work as of January 1, 2024. The AROs as of December 31, 2035 are estimated to be:

Figure 22

Asset Retirement Obligations as of December 31, 2035 by Asset			
Asset	Well Abandonment	Facility Demolition and Site Restoration	Total
THUMS	\$ 714,910,267	\$ 565,502,470	\$ 1,280,412,737
Tidelands	\$ 265,603,982	\$ 272,887,820	\$ 538,491,802
SHEU	\$ 33,429,403	\$ 2,270,246	\$ 35,699,649
E&T LLC (*)	\$ 3,728,096	\$ -	\$ 3,728,096
Total	\$ 1,017,671,747	\$ 840,660,537	\$ 1,858,332,284

(*) – The ARO of \$3,728,096 only represents the ARO associated with the wells in which the COLB holds the carried working interest of 0.392318.

The December 31, 2035 AROs by entity are as follows:

Figure 23

Asset Retirement Obligations as of December 31, 2035 by Entity			
Entity	Well Abandonment	Facility Demolition and Site Restoration	Total
State of CA	\$ 756,493,858	\$ 633,747,440	\$ 1,390,241,298
COLB	\$ 104,282,773	\$ 101,328,026	\$ 205,610,799
Others	\$ 156,895,116	\$ 105,585,070	\$ 262,480,186
Total	\$ 1,017,671,747	\$ 840,660,537	\$ 1,858,332,284

The state and city have built reserve funds to address the future AROs associated with THUMS LBU and Tidelands. These reserve funds currently stand at \$81,276,000 for the city and \$329,959,955 for the state. This review assumes that the state will continue to fund their reserve at the current rate, which is 50% of the state’s net revenue up to \$2,000,000 per month. This review also assumes that the city will continue to fund their reserve at the current rate, which is \$729,167 per month. To estimate future state contributions to their reserve fund through December 31, 2035, the forecasted net revenue and expenses used in estimating future COLB revenue from mineral interest ownership was also applied. This review assumes that the city reserve funds will be invested and yield an annual investment return of 2.9141% per year, in line with the return on investment on the pooled investment portfolio as of September 30, 2023. This review assumes that the state reserve funds will be invested and yield an annual investment return of 3% per year, in line with the 2023 return on the California Pooled Money Investment Account. With these assumptions, the asset retirement obligations and reserve funds as of December 31, 2035 are estimated to be as follows:

Figure 24A

Asset Retirement Reserves as a Percentage of Obligations as of December 31, 2035 (Base Case)				
Entity	Obligations	Reserves	Deficit	Reserves as % of Obligations
State of CA	1,390,241,298	689,793,404	(700,447,895)	50%
COLB	205,320,883	240,770,994	35,450,112	117%

Figure 24B

Asset Retirement Reserves as a Percentage of Obligations as of December 31, 2035 (SB 1137 Case)				
Entity	Obligations	Reserves	Deficit	Reserves as % of Obligations
State of CA	1,390,241,298	677,871,654	(712,369,645)	49%
COLB	205,320,883	240,770,994	35,450,112	117%

Passage of SB 1137 will not decrease COLB revenue from oil operations in the City below \$8,750,000 prior to the end of 2035, allowing the City to continue making an annual contribution of \$8,750,000 through the end of 2035.

The state can narrow the deficit between their obligations and reserves to \$466,048,582 by December 31, 2035, if they were to dedicate 100% of their net proceeds from oil operations in the city to their reserve fund.

Other City of Long Beach Oil Operations

Future well abandonment costs for other COLB oil operations were based on well counts derived from the previously mentioned list of wells located in the city multiplied by the average West Wilmington well abandonment costs. The Warren E&P wells are newer wells that were drilled and completed in a manner that results in lower abandonment costs. The above table assumes an average abandonment cost of \$150,000 per well for the remaining Warren E&P wells.

CalGEM issued the first revised text of the proposed regulations addressing Senate Bill 551 – Cost Estimate Regulations. This text includes information on estimating the costs of abandoning surface facilities and

performing lease restoration on oil and gas operations in the state. A very rough estimate of the number of surface facilities (tanks, vessels, and piping) associated with other COLB oil operations was generated through a review of Google Earth aerial views of tank settings and South Coast Air Quality Management District (SCAQMD) Permits to Operate (PTOs) for these other operations. This estimate of the number of surface facilities was combined with the cost data contained in the first revised text of the Cost Estimate Regulations to generate a very rough estimate of the abandoning surface facilities and performing lease restoration work on the other COLB oil operations.

The THUMS Belmont Offshore wells are located on the THUMS LBUdrilling islands. The facility demolition and surface restoration work for these wells are included in the THUMS LBU costs. Finally, there were numerous public comments from knowledgeable entities addressing the initial text of the proposed regulations. A review of oil industry comments indicates that the industry believes that the estimates derived using the text of this regulation are high end cost estimates of AROs. The resulting high side estimate of AROs for the other COLB oil operations are as follows:

Figure 25

Asset Retirement Obligations - Other COLB Operators			
Entity	Well Abandonment	Facility Demolition and Site Restoration	Total
Arrowhead Operating, Inc.	\$ 1,532,840	\$ 518,148	\$ 2,050,988
Cal Resources Long Beach	\$ 29,123,960	\$ 16,920,601	\$ 46,044,561
E&T LLC	\$ 5,211,656	\$ 1,084,195	\$ 6,295,851
Herley-Kelley LLC	\$ 306,568	\$ 175,014	\$ 481,582
P&M Oil Company	\$ 2,452,544	\$ 704,638	\$ 3,157,182
S&C Oil Company	\$ 919,704	\$ 277,279	\$ 1,196,983
Signal Hill Petroleum	\$ 28,204,256	\$ 4,600,636	\$ 32,804,892
Synergy Oil & Gas LLC	\$ 17,858,743	\$ 3,637,664	\$ 21,496,407
The Landsale Company	\$ 2,145,976	\$ 529,594	\$ 2,675,570
The Termo Company	\$ 6,744,496	\$ 1,890,355	\$ 8,634,851
THUMS - Belmont Offshore	\$ 11,036,448	\$ -	\$ 11,036,448
TJ Scott Family Inv	\$ 306,568	\$ 219,992	\$ 526,560
Warren E&P, Inc.	\$ 3,300,000	\$ 1,000,000	\$ 4,300,000
Total	\$ 109,143,759	\$ 31,558,117	\$ 140,701,876

These AROs are the responsibility of the listed operators. CalGEM requires that these operators have bonds in place addressing future asset retirement obligations, and they are also responsible for ensuring that the operators complete their asset retirement obligations.

Orphan Wells Located in the City of Long Beach

CalGEM defines an orphan well as a well that has no party responsible for it, leaving the State of California to plug and abandon it. CalGEM has plugged and abandoned about 1,400 orphan wells since 1977. Passage of the Bipartisan Infrastructure Law in November 2021, along with funds set aside in the 2022 / 2023 California State Budget and from legislation aimed at increasing industry contributions for State abandonment provided a significant increase in funding for the abandonment of orphan wells. CalGEM is taking a more systematic approach to identifying and addressing orphan wells across California in a manner that focuses on those wells that might pose the most risk to California communities. One outcome of this approach was CalGEM’s release of their “Final Orphan Well Screening Results – GIS Mapping

Application” on February 21, 2023. CalGEM has plans to abandon 378 of the State’s highest-priority orphan wells along with decommissioning 51 facilities, with an estimated cost of approximately \$80 million. One of these well abandonments, the Harold C. Morton 5, is in the City of Long Beach.

A review of this GIS application along with a Google map showing the boundary of the City of Long Beach indicates that there are 77 wells listed as orphaned in the city. One of these has ExxonMobil as the operator of record. ExxonMobil will likely be contacted by CalGEM and directed to abandon this well. As mentioned earlier, the Harold C. Morton 5 will soon be abandoned by CalGEM. The remaining 75 wells are operated by entities that are no longer active in oil operations and are not currently scheduled for abandonment by the state. The current liability associated with these 75 wells, using the current LBERD average West Wilmington abandonment cost of \$306,568, is \$22,992,600. Escalating this figure at 2.8% per year (see CA SLC Staff Report 82) indicates that this figure will grow to \$31,925,915 by December 31, 2035. As per the CalGEM definition, this liability rests with the State of California.

Post-Production Retention Wells and THUMS LBU Islands

LBER prepared a “City of Long Beach Oil Operations Transitional Reservoir Abandonment and Post-production Subsidence Control Plan” (TRAPPS) in 1999. This document details the effort and estimated cost associated with preventing subsidence after production is halted in the West Wilmington field. A draft update of the TRAPPS was prepared in 2004. No formal TRAPPS was issued in 2004, and no updates have been completed since the original 1999 TRAPPS. LBER is currently in the process of updating the TRAPPS.

The 1999 TRAPPS report calculated a cumulative voidage (unoccupied pore space) the various hydrocarbon zones in West Wilmington of 992.0 million barrels. Assuming a given volume of fluid will be necessary to re-pressure the aquifer to reservoir pressures, then the longer the oil operations continue to provide this volume through over-injection, the less injection will be necessary during post-production operations. A review of Tidelands and THUMS LBU production indicates that water injection has exceeded the sum of oil production and water production by approximately 754.0 million barrels since preparation of the 1999 TRAPPS. This indicates that the current voidage is roughly 238.0 million barrels as of December 31, 2023. Based on the production forecasts discussed earlier in this report, water injection from 2024 – 2035 should exceed the sum of oil production and water production by about 289.7 million barrels over this same time frame. The voidage should therefore be eliminated prior to December 31, 2035 (-51.7 million barrels).

The 1999 TRAPPS included an estimate of the post-production subsidence control costs for the West Wilmington field. The “Expected Case” (base case) cost estimate in the 1999 TRAPPS, based on voidage of 992 million barrels, was \$234.7 million dollars. Escalating this figure at 2.8% per year results in an estimate of post-production subsidence control costs of \$652.0 million dollars as of December 31, 2035. This estimate ties back to the original voidage of 992 million barrels.

The city and state created a Subsidence Reserve Fund to address the post-production subsidence control costs. This fund has a current (February 6, 2024) balance of \$198.5 million dollars. This review assumes that these reserve funds will continue to be invested and yield an annual investment return of 2.9141% per year, in line with the City of Long Beach return on investment on the pooled investment portfolio as of September 30, 2023. Growing the existing reserve fund at 2.1941% per year results in a Subsidence Reserve Fund of \$281.4 million dollars as of December 31, 2035.

Although the estimated Subsidence Reserve Fund is projected to be 43% of the estimated mitigation cost as of December 31, 2035, this shortfall is based on the 1999 voidage of 992 million barrels. The voidage is forecast to be filled by the end of 2035. This should greatly reduce the amount of water injection needed to address post-production subsidence. It is therefore likely that the Subsidence Reserve Fund will be adequate to address the post-production subsidence control costs for the West Wilmington field by the end of 2035.

Notes and Assumptions

The oil production provided directly by the operators and the production data sourced from the CalGEM WellStar web site was assumed to be accurate. No effort was made to verify the accuracy of this reported production data.

The City of Long Beach holds unique ownership interests in individual wells, units, and fault blocks. The production forecasting methodology was adjusted based on these unique ownership interests. Future production was forecast on an individual well basis for COLB ownership in these individual wells. Other wells (mainly California Resources Long Beach Inc. wells) are paid on a unit or lease basis, but CalGEM does not report the production on a unit or lease basis. Production for these units and leases was forecast on an individual well basis and the wells were grouped into the appropriate unit or lease in the oil and gas software package. Although a majority of the SHEU and SHWU are in the City of Signal Hill, there are SHEU and SHWU wells located in Long Beach. The CalGEM maps were analyzed in conjunction with a Google map showing the boundary of the City of Long Beach to determine which of the SHEU and SHWU wells are located in the COLB. Production for the SHEU and SHWU wells located in the COLB were forecast on an individual well basis to estimate tax revenue for the city. Signal Hill Petroleum provided SHEU and SHWU production on a unit basis. Production from these units was forecast on a unit basis from estimate future COLB revenue from city ownership in the units. LBERD provided production by city for West Wilmington (Tidelands), which straddles Long Beach and Los Angeles. Production was forecast on a city basis for Tidelands. THUMS LBU is 100% within the COLB. LBERD provided THUMS LBU production data, and future production was forecast on a unit basis.

The operating costs in this review were forecast on a \$ per barrel of oil basis, with actual operating cost data used when available (SHEU, Tidelands, THUMS LBU). Forecasting of operating costs on a \$ per barrel of oil basis is common in oil and gas valuation work. A more nuanced (and accurate) methodology for oil operations involves analyzing the operating cost data and breaking it down into four components: fixed costs, costs that vary based on the number of wells, costs that vary based on the volume of oil produced, and costs that vary based on the volume of water production. This nuanced methodology yields higher operating expenses in the outlying years. Use of this detailed methodology was beyond the scope of this review. The simplified \$ per barrel of oil approach might have: (a) overstated revenue in the outlying years from COLB mineral interest ownership; and (b) understated COLB overhead revenue in these same outlying years. Use of the more detailed operating cost forecasting methodology would not have a meaningful impact on the results of this review.

The Utility Users Tax (UUT) is a part of the electrical bill that operators pay. Electricity charges, including the UUT, are traditionally evaluated as a part of the operating expenses of an oil well. This review included the electricity charges (with UUT) as a part of the forecast of operating expenses. These forecasts were made on a \$ per barrel of oil basis. Separate calculations of just the UUT were made to forecast COLB revenue from the UUT.

Exhibit 1

Historical and Forecast Oil Prices

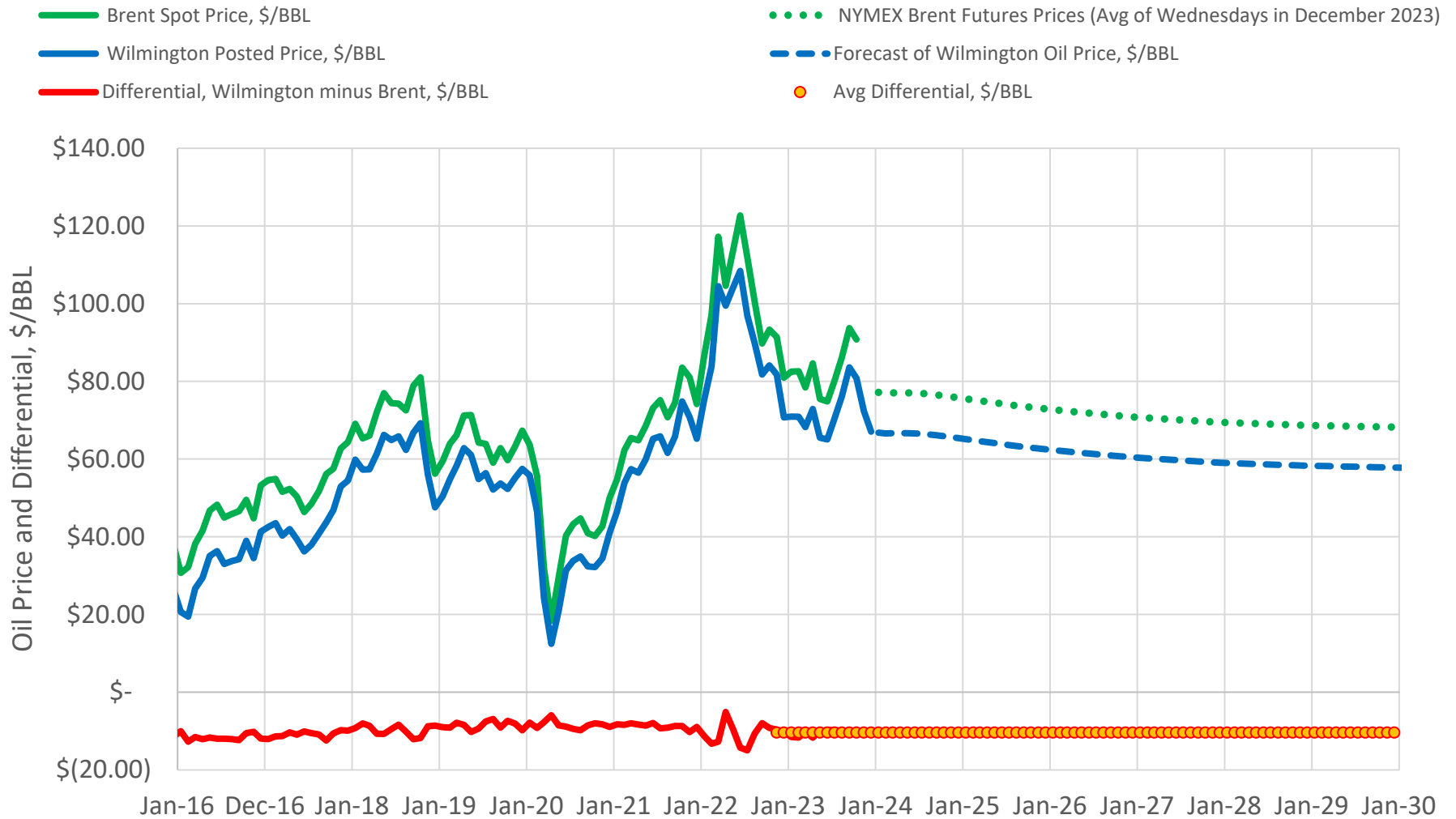
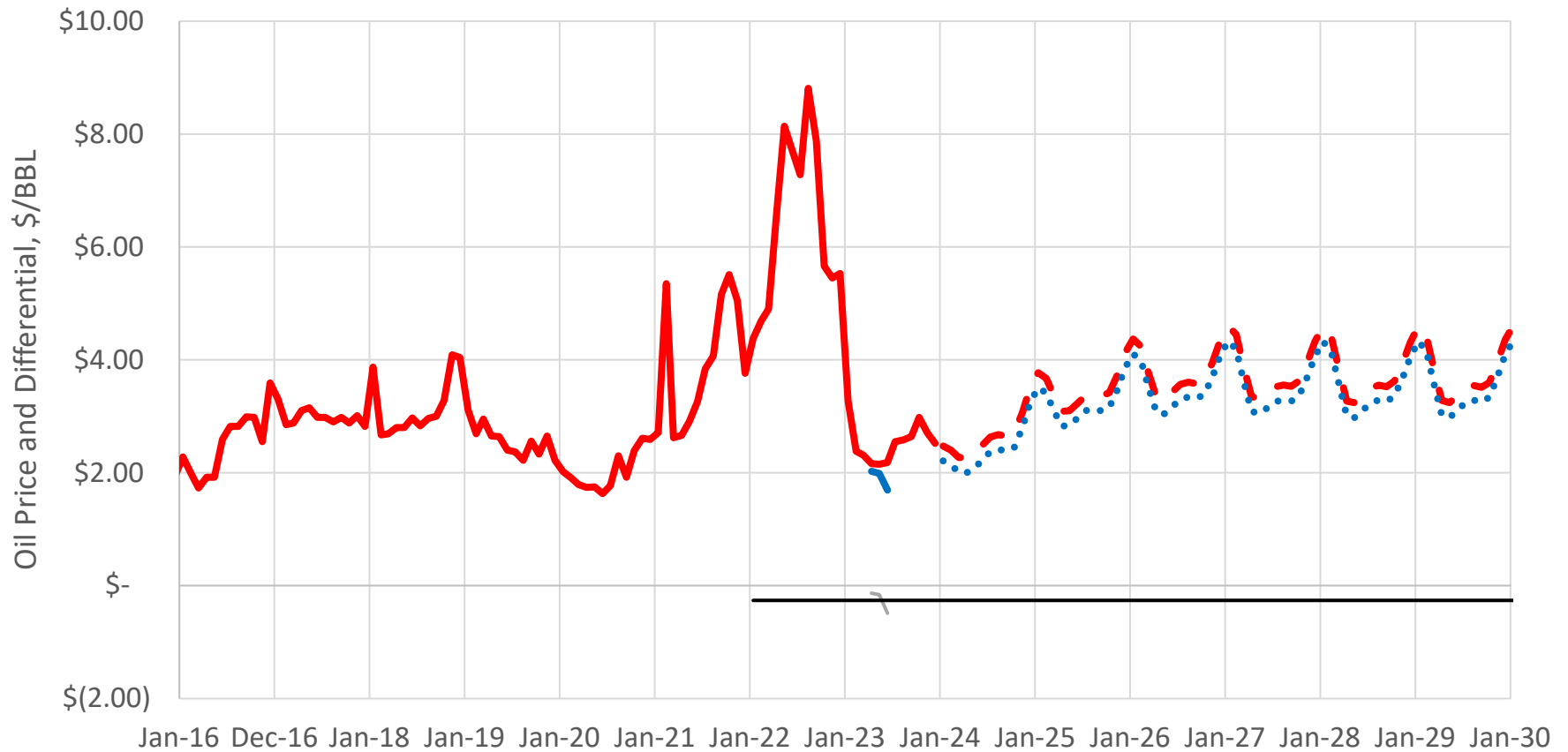


Exhibit 2 Historical and Forecast Gas Prices

- Henry Hub Spot Price, \$/MCF
- Recreation Park Gas Price, \$/MCF
- Differential, Recreation Park minus Henry Hub, \$/MCF
- - Henry Hub Futures Prices (Avg of Wednesdays in December 2023)
- Forecast of Recreation Park Gas Price, \$/MCF
- Average Differential, \$/MCF



APPENDIX A

The Flow of Revenues from Oil Operations in the City of Long Beach

Kevin Tougas

Oil Operations Manager

2014

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ABBREVIATIONS RESOURCE

City	City of Long Beach
LBGO	Long Beach Gas & Oil
LBOD	Long Beach Oil Development Company
OLBI	Oxy Long Beach, Inc.
OWPA	Optimized Waterflood Program Agreement
TORF	Tidelands Oil Revenue Fund
TOF	Tidelands Operating Fund
UPRC	Union Pacific Resources Company
THUMS	Texaco, Humble, Union, Mobil Oil, and Shell
Tidelands OPC	Tidelands Oil Production Company

OVERVIEW

The flow of revenue to the City of Long Beach and the State of California from the production of oil and gas in Long Beach is governed by legislation and contracts that date as far back as the 1950's. Rarely is a contract terminated, but instead they are added layer by layer on top of each other, complicating the process for determining the allocation of revenues to each party. Long Beach Gas and Oil (LBGO) and Oxy (THUMS Long Beach Company and Tidelands Oil Production Company) administer the accounting for the Wilmington oil field that falls under the control of the City of Long Beach. LBGO also receives revenues from other oil fields in Long Beach, but does not control their respective operations. This document will review how revenues and expenses from oil and gas production are determined, where the City or the State is involved. This document cannot be static; however, an update will be necessary as each new contract is created or amended.

This document is a high level review of how the revenue from the oil operations is distributed. Some references to legislation and contracts are cited throughout, but the exact language pertaining to the distribution is not included in this text. Additionally, this document only touches on those contracts that pertain directly to the distributions of net profits. There are a myriad of other contracts that govern the oil operations in Long Beach but are not included in this document.

INTRODUCTION

Figure 1 - Oil Operating Areas in Long Beach details the primary areas where revenue is generated from oil production. The Wilmington oil field (West Wilmington and Long Beach Unit [or East Wilmington]) dominates the map, although there are some portions of the Wilmington oil field that are outside the City limits. The Signal Hill West and East Units are part of the Signal Hill oil field (also known as Long Beach oil field); the Central Unit is entirely within the city boundaries of Signal Hill. The Recreation Park lease and the City Wasem lease are small oil plays along the Newport Inglewood Fault zone. The Seal Beach oil field is not shown on the map because the City of Long Beach does not receive net profits from the sale oil or gas from this field. LBGO does receive revenues from oil and gas production in other areas not shown on the map and will be discussed later.

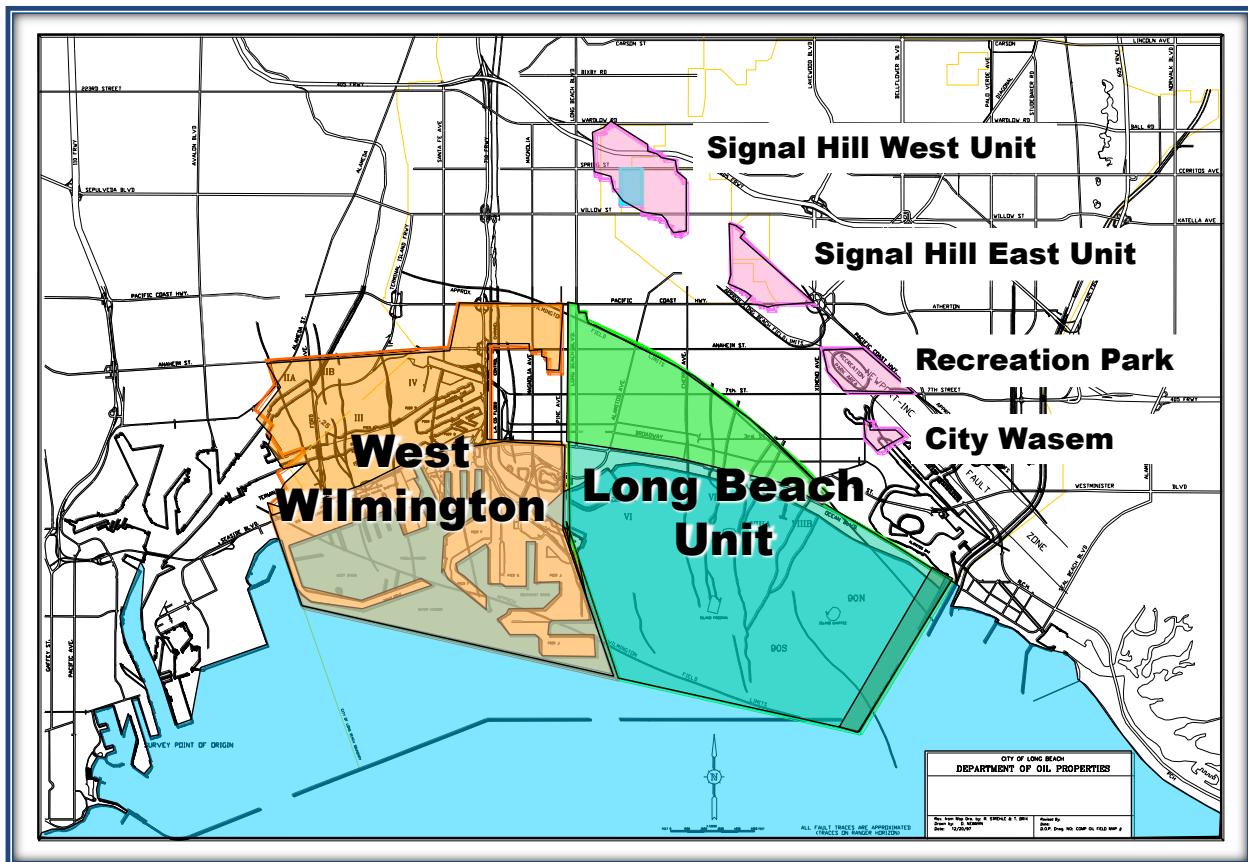


Figure 1 - Oil Operating Areas in Long Beach

West Wilmington

The western portion of the Wilmington oil field has been producing oil and gas since the early 1930's. From the 1940's through the 1960's, issues with subsidence were occurring from the volume of oil, water, and gas being produced in this portion of the field, although production from the Long Beach and Seal Beach oil fields also contributed.

Figure 2 - West Wilmington denotes the three contractually separated areas in West Wilmington. Segment 1 is State Tidelands, and the City has been operating this area since the inception of oil field operations. Originally, Union Pacific Resources (UPRC) owned and operated the western section of Segment 2 (Fault Blocks I – III, refer to Figure 3), and Mobil Oil operated the eastern section of Segment 2 (Fault Blocks IV and V).

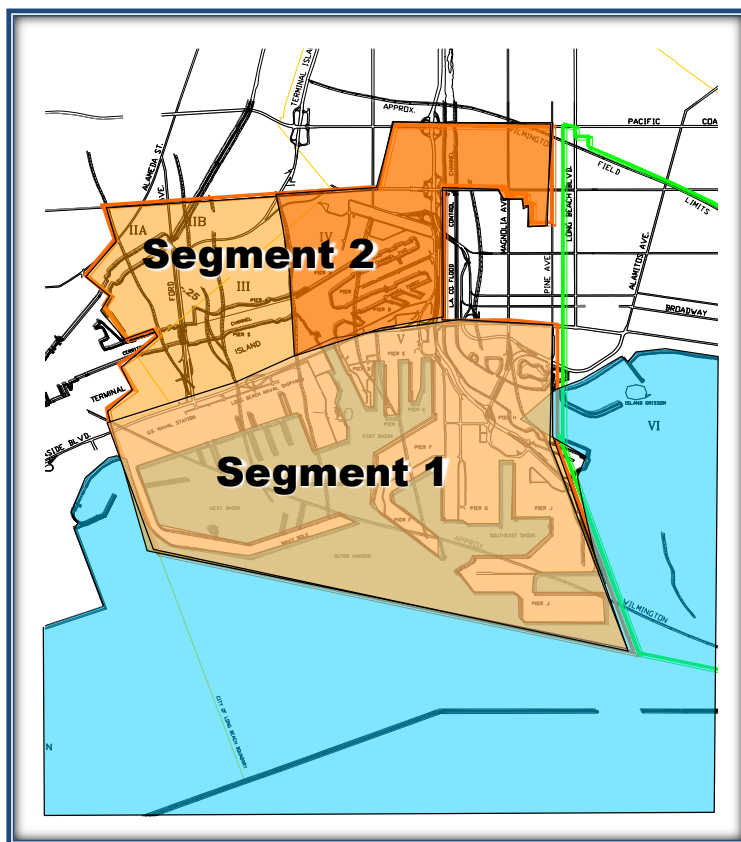


Figure 2 - West Wilmington

The West Wilmington oil field is broken contractually in a variety of ways. Segment 1 denotes the portion of the field that is in the California State tidelands as granted to the City by Chapter 676, Statutes of 1911, Chapter 102, Statutes of 1925, and Chapter 158, Statutes of 1935. The City received these properties in trust for the purposes of developing commerce, navigation, fisheries, and recreation. The California Supreme Court ruled in 1938 that the development and production of oil from the tidelands was compatible with the trust and therefore, the City (at that time) could retain all the net profits from the granted lands and not transfer the proceeds to the State.

In 1939, the City of Long Beach, through its Harbor Department, entered into its first 25-year Field Contract with Long Beach Oil Development Company (LBOD) to develop the tidelands oil properties. Originally, the City retained the Trust's entire share of revenues derived from oil and gas produced from the tidelands. Most of the revenues at that time were expended to develop and improve the facilities of the Long Beach Harbor. By the

early 1950's, the City had accumulated more tideland oil revenue than it could easily spend within the tidelands. In 1951, the State legislature (with the urging of the City) passed Chapter 915, an act which declared that 50% of the revenue derived from the oil operations on the trust lands (with the exception of dry gas revenue) was free of the trust and any of its conditions or restrictions. As a result, the City amended the City Charter to provide that 50% of the oil revenue realized each month would be deposited into the Public Improvement Fund to be used for general City purposes.

The City and State were sued for removing the restrictions on the tidelands oil revenues and the State Supreme Court agreed that the revenues were restricted to benefit the entire State. The State enacted Chapter 29, Statutes of 1956, that appropriated \$122 million of surplus tideland oil revenue (50% of the revenues generated to date) for the State and determined that future trust oil revenues would be shared equally between the City and the State. Chapter 29 also determined all future gas revenues generated in the tidelands would go to the State.

During the 1940's, the Federal Government was also eyeing the amount of revenue that was being generated in the tidelands of California, Texas, Louisiana, and other states. In litigation, ownership of the first three miles of a state's costal submerged lands was transferred to the federal government. In the case of Unites States vs. California in 1947, the United States successfully argued that the three nautical miles seaward of California belonged to the federal government. In response to this litigation, Congress adopted the Submerged Lands Act in 1953, which President Eisenhower signed, granting title to the natural resources located within three miles of the coastline to California (including oil, gas, and other minerals).

In 1964, LBOD was again the successful bidder for the new 25-year Long Beach Harbor Parcel Field Contract with a bid enabling the City to retain 91% of the net profits on behalf of the State. During the same year, Chapter 138, Statutes of 1964 (First Extraordinary Session), was passed. With the passing of Chapter 138, the City no longer received net profits from West Wilmington starting in 1967. The City could allocate some expenses (subsidence charges, staff time, building rental, etc.) against the 91% of the net profits, but the remaining amount was transferred to the State within 60 days after the City received it. Prior to 1967, the net profits being retained by the City were transferred into the Harbor Oil Revenue Fund. After 1967, the City did start to receive a set, declining amount from the Long Beach Unit which was deposited into the Tidelands Operating Fund. [Chapter 138 -Section 4\(e\)\(14\) states "During the calendar year 1988, and each calendar year thereafter, the total sum of one million dollars \(\\$1,000,000\) during each said year." This payment is actually a transfer from TORF to TOF, and is not included in the OWPA. The transfer occurs every December.](#)

In 1974, the City amended the Contractors Agreement to allow LBOD to do contract operations within Segment 2 (outside of the tidelands area) of the west Wilmington Field.

In 1989, Tidelands Oil Production Company (Tidelands OPC) was awarded the new 11-year Field Contract for the Long Beach Harbor Tidelands Parcel and Parcel “A” areas with a bid enabling the City to retain 95% of the net profits on behalf of the State. Although, as in the 1964 contract, the City could charge some expenses but the majority of the net profits would be transferred to the State within 60 days of the City receiving them.

Figure 3 - West Wilmington Fault Blocks illustrates how West Wilmington is broken down by Fault Blocks. Fault Blocks are assumed to be areas that are self-contained and fluid (water, oil, and gas) does not flow from one Fault Block to another. Each of these areas were geologically described when the field was first being developed in the 1940’s, but it was not until the late 1950’s and early 1960’s that the areas were contractually separated. In 1958, the State enacted the Subsidence Control Act enabling the City to force unitization of subsidence-prone areas in order to prevent the sinking of the surface. In the early 1960’s, Fault Blocks II, III, IV, and V Units were formed with the City as Segment 1 (tidelands) Unit Operator and UPRC as Segment 2 Unit Operator for Fault Block II and III Units and Mobil Oil as Segment 2 Unit Operator for Fault Block IV and V Units. Fault Block I was not unitized because it was owned in whole by UPRC.

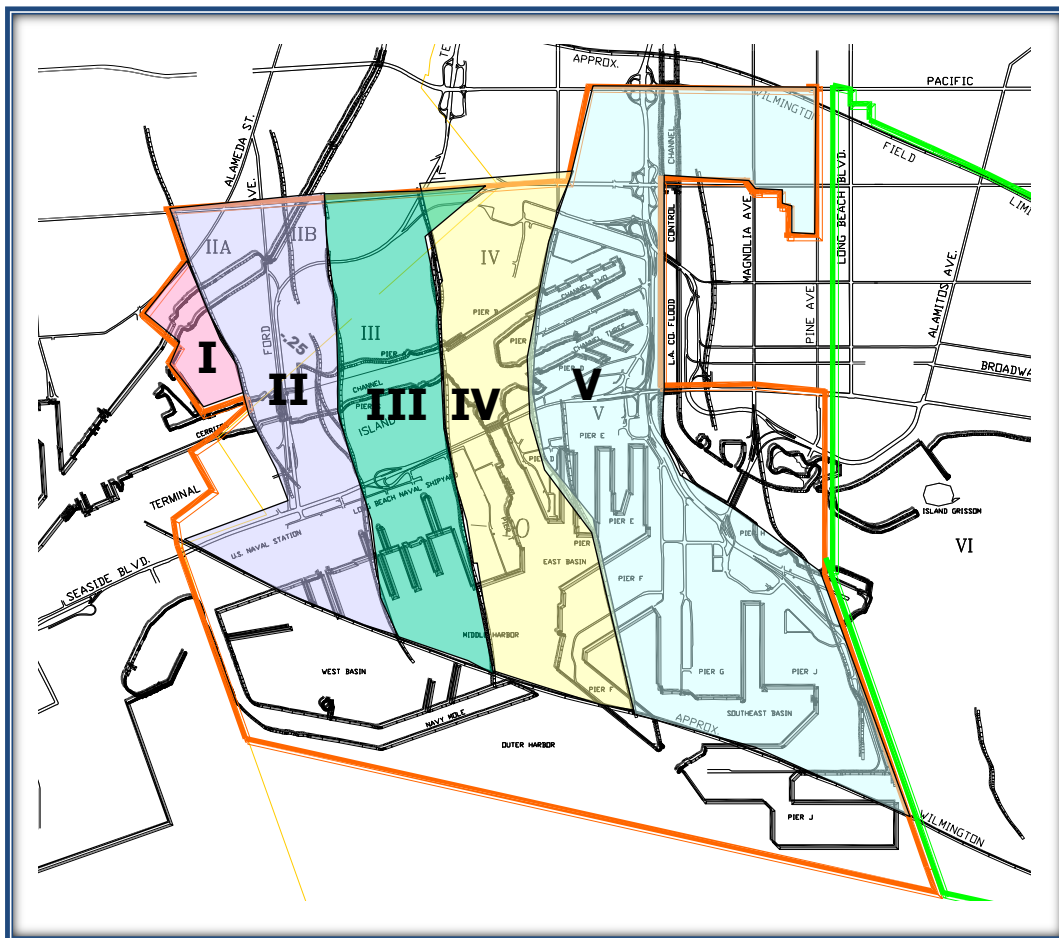


Figure 3 - West Wilmington Fault Blocks

The Unit Agreements allowed for each of the Fault Block Units to function as a standalone operation even though each had multiple ownerships. The owners shared in the expenses and profits based on agreed equity ownerships. Each operator (City, UPRC, and Mobil Oil) was allocated an Administrative Overhead fee (6% of expenses incurred in the oil field) in compensation and acknowledgement that the operators did not have the ability to charge for all expenses back to the oil field.

In 1989, Mobil Oil contracted with Tidelands OPC to conduct the day-to-day operations in Segment 2 of Fault Block Units IV and V for two-thirds of the 6% of the Administrative Overhead, Mobil Oil retained one-third of the Administrative Overhead. In 1993, UPRC contracted with Tidelands OPC to operate its Segment 2 areas in Fault Block Units II and III and its Fault Block I non-unit area for the same split of Administrative Overhead as Mobil Oil had done in 1989. In 1991, the State enacted legislation authorizing the City, with approval of the State Lands Commission, to extend the term of the Contractors Agreement in Segment 1 to the year 2024 based on the implementation of a thermal oil recovery project. In 2012, the Segment 1 Contractors agreement was extended to the end of field life. The other two contractors' agreements (both in Segment 2) do not have termination dates.

In 1991, major oil companies (ARCO, Chevron, Exxon, Mobil Oil, Phillips, and Texaco) with working interests in Fault Block Units IV and V quit claimed their interests back to the thousands of mineral rights owners. Quit claiming by an entity allows for it to remove itself of all liability and profits. In this case, many of the oil companies, as Working Interest owners of a Tract (defined land area with mineral interests ownership) had to pay royalties to other owners within the Tract. An oil company may own the majority of a Tract, but others had ownerships within the Tract. The oil companies' desire at the inception of the oil field was to allow for development of the oil field. The oil companies negotiated the other participants of the Tract into royalty arrangements to allow for development. Since oil production had declined and oil prices had stayed low, the oil companies were not making a profit. Once the companies quit claimed, the royalty interest owners became working interest owners instead. Most of the new working interest owners (WIO) also quit claimed (there was worry the oil field would cease and all WIO's would need to pay the abandonment costs). Once a WIO quit claims, those interests are divided among the remaining working interest owners (the City and the State cannot quit claim).

UPRC initiated a pilot steamflood in the Fault Block II Unit in 1983. In 1989, based on the results of the pilot, UPRC proposed a full-scale expansion. UPRC also participated in a joint venture in the Harbor Cogeneration Plant with Mission Energy to provide steam for the steamflood development.

In 1994, the Harbor Department, on behalf of the City of Long Beach, purchased UPRC's land and mineral interests in the Wilmington Field for \$405 million. The purchase included

725 acres of surface in both Long Beach and Los Angeles, oil interests in Fault Blocks I-V, and 70% interest in the Harbor Cogeneration Plant. By City Charter, the Department of Oil Properties (now part of LBGO) became Unit Operator for all of Segment 2. Eventually, the Harbor Department sold its interest in the Harbor Cogeneration Plant to Indek.

As stated above, when Mobil Oil quit claimed its ownership and when UPRC was purchased by the Harbor Department, the City became the Unit Operator for all of West Wilmington. The three Contractors agreements, Segment 1 (City and Tidelands OPC), Segment 2 (UPRC and Tidelands OPC), and Segment 2 (Mobil Oil and Tidelands OPC), are still in place. The City assumed both the UPRC and the Mobil Oil contacts, and since Tidelands OPC was the contractor to Mobil Oil and UPRC, Tidelands OPC remained as contractor to the City.

In 2006, Oxy purchased Tidelands OPC and thus became the field contractor for both Long Beach Unit and West Wilmington. The City and Oxy later agreed to share the administrative overhead throughout West Wilmington with the City receiving 4% and Oxy 2%. In 2012, the City, State and Oxy finalized an OWPA that covers the State's interest in West Wilmington. The City and Oxy also agreed to an OWPA for the City's Tidelands and Uplands holdings in West Wilmington. Similar to the OWPA in Long Beach Unit, the government entities received 51% of the incremental net profit and Oxy retains 49%.

Figure 4 - Ownership % by Fault Block illustrates the ownership breakdown by each Fault Block. City Uplands flows into the General Fund, State Tidelands is the State of California ownership percentage in the tidelands area, and State Uplands is also owned by the State of California; however, the ownership is not in the tidelands. The numbers are representative of the percentages, but occasionally a working interest owner will quit claim and the numbers will change slightly.

West Wilmington - Fault Block Units						
	City Uplands	State Tidelands	State Uplands	City TOF	Townlot	Total
Fault Block I				100.00000%		100.00000%
Fault Block II Steam Flood		10.00010%		89.99990%		100.00000%
Fault Block II Water Flood		10.00010%		89.53680%	0.46310%	100.00000%
Fault Block III		17.70460%		82.29540%		100.00000%
Fault Block IV	13.67080%	55.08853%	4.53159%	25.85651%	0.85257%	100.00000%
Fault Block V	8.13746%	72.90223%	6.59490%	3.45603%	8.90938%	100.00000%
Fault Block V Steam Flood		100.00000%				100.00000%
Non Steam		100.00000%				100.00000%
Total	21.80826%	365.69556%	11.12649%	391.14464%	10.22505%	800.00000%
% of Total	2.726032%	45.711945%	1.390811%	48.893080%	1.278132%	100.000000%

Figure 4 - Ownership % by Fault Block

Long Beach Unit

In 1962, after the City proved it could control subsidence, it placed a referendum before its residents to allow development of the offshore area (East Wilmington oil field) from four landscaped oil islands under direction and control of the City. In 1964, the State enacted Chapter 138, Statutes of 1964 (First Extraordinary Session), authorizing the City to develop the offshore area as a unit with the City as Unit Operator. THUMS (Texaco, Humble, Union, Mobil Oil, and Shell) became the Field Contractor with a bid providing 95.5% of the net profits going to the City, although the City would transfer the net profit to the State. Not all the net profit would go to the State; the City would retain some of the profit for payment for employees, subsidence costs, and other costs as stated in Chapter 138. Initial development occurred from Pier J while the oil islands were constructed (Island Grissom in 1966 and Islands White, Chaffee, and Freeman in 1967). The City required water injection of at least 5% more than the total fluid production from compaction-prone reservoirs.

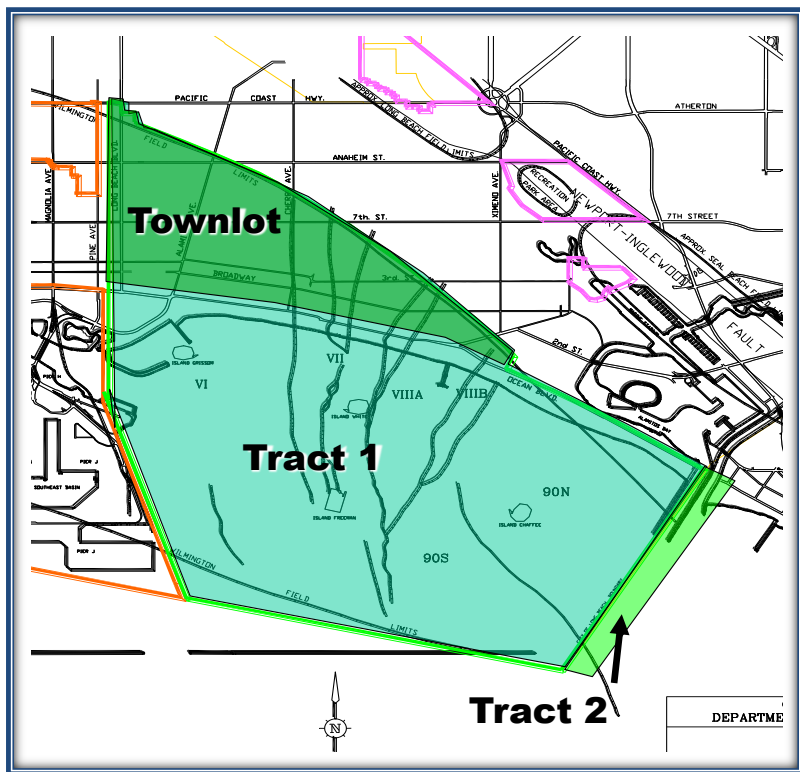


Figure 5 - Long Beach Unit

In the early 1980's, the City initiated a successful sub-zone redevelopment program that added significant production and reserves. By the mid-1980's, the collapse of world oil prices caused the City, in agreement with the State, to suspend the redevelopment program because of a shortage of funds.

After reviewing information gained through the final equity resolutions and the results of the City's redevelopment program, Atlantic Richfield Company (ARCO) approached the City and the State in the early 1990's with a proposal to develop and fund an optimized waterflood program for a share of the incremental production. The State enacted Chapter 941, Statutes of 1991, authorizing the City, State, and ARCO to enter into an "Optimized Waterflood Program Agreement" (OWPA). The OWPA became effective in 1992. ARCO purchased the shares of THUMS from the original owners and acquired the interest of the

non-operating contractors. With the purchase of THUMS, ARCO became the Field Contractor and THUMS became the Agent for the Field Contractor. When BP purchased ARCO in 1998, BP sought to release some of the acquired assets, including the Long Beach Unit. In 2000, Oxy agreed to purchase both the operating contract and the non-operating contract interest and has been the field contractor since that time.

Figure 6 - Long Beach Unit Contractor Ownership shows the three major ownerships of the Long Beach Unit. The largest area is Tract 1, which the City owns in trust for the State. Tract 2 is owned by the State, and the Townlot area is owned by individual working interest owners (3,000 plus), of which the City of Long Beach is the largest single owner. Unlike the West Wilmington, the Long Beach Unit is operated under a single Unit, Unit Operating, and Contractor agreement. As noted on the figure, the Operating Contractor bid on 80% of Tract 1, and the remaining non-operating Contractors bid on predetermined percentages of the remaining 20% of Tract 1.

Ownership/Stakeholder Participation Wilmington Oil Field				
EAST WILMINGTON – LONG BEACH				
	Unit Participation	Oxy/THUMS NP Interest	State's NP Interest	Total
TRACT 1				
Field Contractor – 80%	69.128320%	4.440000%	95.560000%	100.000000%
Non Operating Contractor – 10%	8.641040%	1.723000%	98.277000%	100.000000%
Non Operating Contractor – 5%	4.320520%		100.000000%	100.000000%
Non Operating Contractor – 2.5%	2.160260%	0.460000%	99.540000%	100.000000%
Non Operating Contractor – 1.5%	1.296156%	0.460000%	99.540000%	100.000000%
Non Operating Contractor – 1%	0.864104%	0.450000%	99.550000%	100.000000%
Total Tract	86.410400%	3.747200%	96.252800%	100.000000%
TRACT II				
	3.819000%	3.750000%	96.250000%	100.000000%
TOWNLOT				
Oxy/THUMS	0.261801%		NX 420	1.316750%
CLB	0.722514%		SR 134	98.683250%
World Long Beach, LLC	0.300866%			100.000000%
Others	8.485419%			
Total Townlot	9.770600%			
TOTAL LBU	100.000000%			

Figure 6 - Long Beach Unit Contractor Ownership

Figure 7 Long Beach Unit % Ownership further breaks down the profits going to the State, OBLI, and to the City and delineates the Oil Net Profit and the Gas Revenue along with the OWPA allocation to each.

LBU Stakeholder Participation Breakdown													
Oil Net Profit	Percent of Tract	Unit Participation	OLBI	State	OLBI			State			City		
			Net Profit Interest	Net Profit Interest	Share of State Incremental Profit	Net Profit Interest - OWPA	Total Net Profit Interest	Share of State Incremental Profit	Net Profit Interest - OWPA	Total Net Profit Interest	Share of State Incremental Profit	Net Profit Interest - OWPA	Total Net Profit Interest
Tract 1													
Field Contractor	80.0%	69.1%	4.4%	95.6%	49.0%	46.8%	51.3%	42.5%	40.6%	40.6%	8.5%	8.1%	8.1%
Nonoperating	10.0%	8.6%	1.7%	98.3%	49.0%	48.2%	49.9%	42.5%	41.8%	41.8%	8.5%	8.4%	8.4%
Nonoperating	5.0%	4.3%	0.0%	100.0%	49.0%	49.0%	49.0%	42.5%	42.5%	42.5%	8.5%	8.5%	8.5%
Nonoperating	2.5%	2.2%	0.5%	99.5%	49.0%	48.8%	49.2%	42.5%	42.3%	42.3%	8.5%	8.5%	8.5%
Nonoperating	1.5%	1.3%	0.5%	99.5%	49.0%	48.8%	49.2%	42.5%	42.3%	42.3%	8.5%	8.5%	8.5%
Nonoperating	1.0%	0.9%	0.5%	99.6%	49.0%	48.8%	49.2%	42.5%	42.3%	42.3%	8.5%	8.5%	8.5%
Total Tract 1	100.0%	86.4%	3.7%	96.3%	49.0%	47.2%	50.9%	42.5%	40.9%	40.9%	8.5%	8.2%	8.2%
Tract 2													
Total Tract 1 & Tract 2		90.2%	3.4%	86.8%	49.0%	47.2%	45.9%	NA	37.2%	37.2%	0.0%	0.0%	7.1%
Townlot													
Oxy Long Beach, Inc.		0.3%	N/A	N/A	N/A	N/A	0.3%	N/A	N/A	0.0%	N/A	N/A	0.0%
City of Long Beach		0.7%	N/A	N/A	N/A	N/A	0.0%	N/A	N/A	0.0%	N/A	N/A	0.7%
Other Unit Participants		8.8%	N/A	N/A	N/A	N/A	0.0%	N/A	N/A	0.0%	N/A	N/A	0.0%
Total Townlot		9.8%											
Total Unit Oil Net Profit		100.0%					46.2%			37.2%			7.8%

Gas Revenue	Percent of Tract	Unit Participation	OLBI	State	OLBI			State			City		
			Net Profit Interest	Net Profit Interest	Share of State Incremental Profit	Net Profit Interest - OWPA	Total Net Profit Interest	Share of State Incremental Profit	Net Profit Interest - OWPA	Total Net Profit Interest	Share of State Incremental Profit	Net Profit Interest - OWPA	Total Net Profit Interest
Tract 1													
Field Contractor	80.0%	69.1%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	0.0%	0.0%	0.0%
Nonoperating	10.0%	8.6%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	0.0%	0.0%	0.0%
Nonoperating	5.0%	4.3%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	0.0%	0.0%	0.0%
Nonoperating	2.5%	2.2%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	0.0%	0.0%	0.0%
Nonoperating	1.5%	1.3%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	0.0%	0.0%	0.0%
Nonoperating	1.0%	0.9%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	0.0%	0.0%	0.0%
Total Tract 1	100.0%	86.4%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	0.0%	0.0%	0.0%
Tract 2													
Total Tract 1 & Tract 2		90.2%	0.1%	90.1%	49.0%	47.2%	1.9%	NA	88.3%	88.3%	0.0%	0.0%	0.0%
Townlot													
Oxy Long Beach, Inc.		0.3%	N/A	N/A	N/A	N/A	0.3%	N/A	N/A	0.0%	N/A	N/A	0.0%
City of Long Beach		0.7%	N/A	N/A	N/A	N/A	0.0%	N/A	N/A	0.0%	N/A	N/A	0.7%
Other Unit Participants		8.8%	N/A	N/A	N/A	N/A	0.0%	N/A	N/A	0.0%	N/A	N/A	0.0%
Total Townlot		9.8%											
Total Unit Gas Revenue		100.0%					2.2%			88.3%			0.7%

F.

Tidelands Parcel and Parcel “A” Oil Contract) with 95% of the net profits going to the City as trustee, but with this contract and the enactment of Chapter 138, the City would no longer split the West Wilmington oil revenue. The extension of the East Wilmington Field contractor’s agreement (Segment 1) to 2024 was a result of the negotiations of Chapter 941 for the Long Beach Unit.

Upland Properties

The City owns working interests and/or royalty interest in several upland properties. The first two (West Wilmington and the Long Beach Unit) have been discussed. The remaining ownerships are located throughout Long Beach. The City retained the mineral rights when the land was originally acquired or deeded to the City (parklands, airport, other). All will be discussed in detail under the section of Uplands Revenue.

REVENUE AND EXPENSES

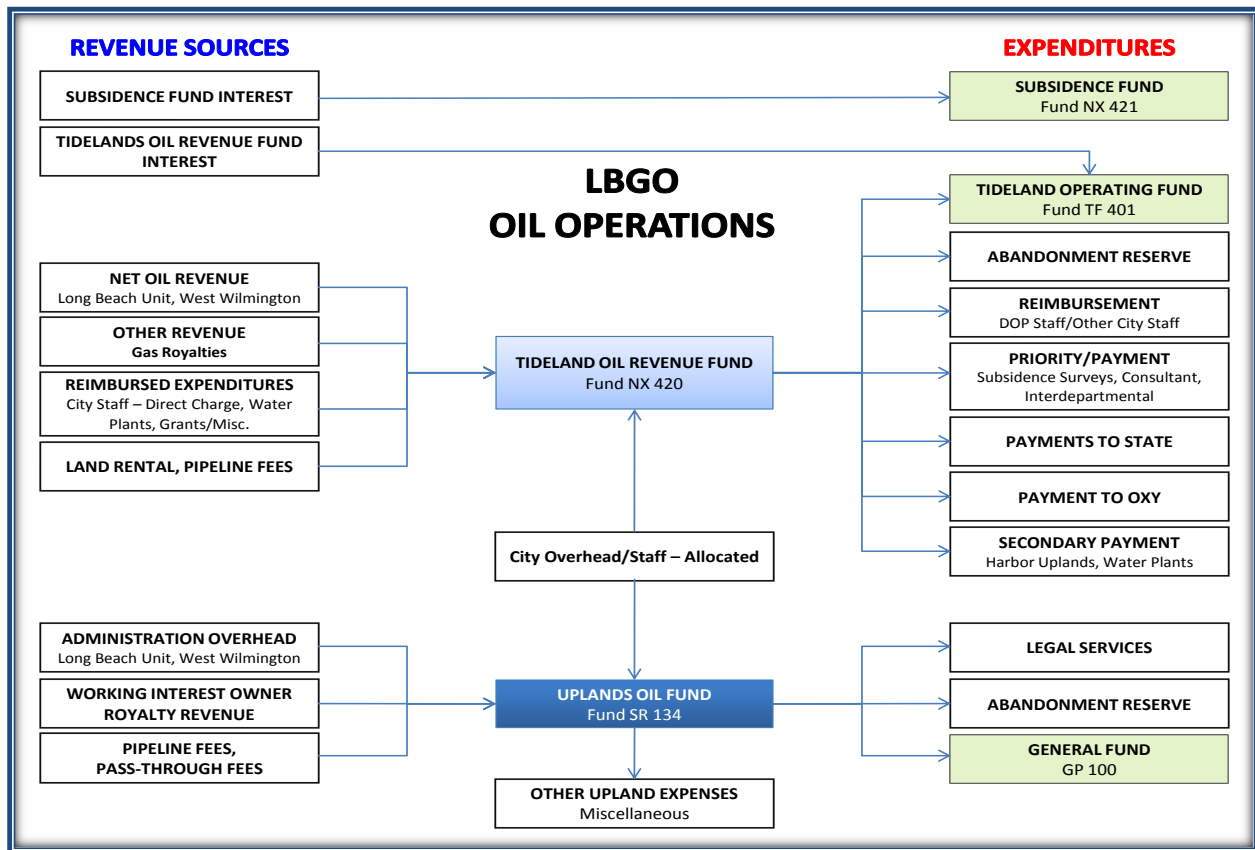


Figure 8 - Revenue Flow

Revenues flow from a variety of sources through either the Tidelands Oil Revenue Fund (NX 420) or the Uplands Oil Properties Funds (SR 134). *Figure 8 - Revenue Flow* exhibits how the revenue passes through the two funds and out to different funds, entities, or for

reimbursements. The chart is only an example of some of the possibilities, as when new contracts are created or legislation is passed, the chart changes. The revenue sources can vary and the same is true with the payment of expenditures on the right side of the chart. The basic sources of revenue are net oil revenue (working or royalty interest), contract administration overhead, reimbursed expenditures (City staff, water injection plants, and other allowed expenses), and payments from contractual obligations. The common expenditures are payments to the Tidelands Operating Fund, State of California, Oxy (THUMS), or reimbursement of City staff time.

Figure 9 - Tidelands Oil Revenue Flow (TORF) describes the revenue flow into and the expenses or payments from TORF.

The reimbursement of City expenses (wages, equipment, building rental, etc.) not directly charged to the Long Beach Unit or to West Wilmington Units is allocated back to TORF, TOF, or Uplands Funds based on LBGO employee time cards. A true up is performed once a year.

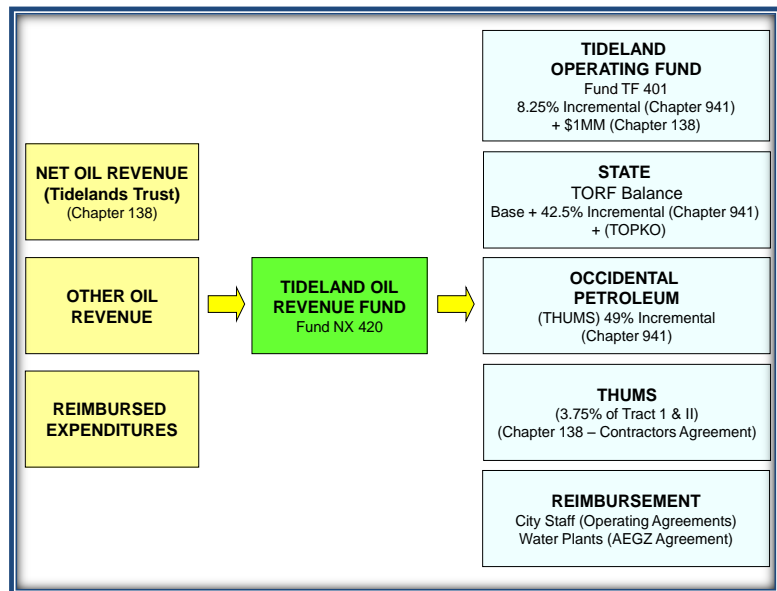


Figure 9 - Tidelands Oil Revenue Flow

As shown in *Figure 9 - Tidelands Oil Revenue Flow*, the City receives into TORF Tidelands net profits from the oil operations (Long Beach Unit and West Wilmington) along with Other Oil Revenue (State ownership not in the Tidelands). The City then distributes TORF revenues to TOF, Oxy (THUMS), State, or others. The State, City, and Oxy have agreed on a hierarchal distribution of revenues if there are insufficient revenues to cover all distributions.

The following is the breakdown of the revenue streams and expenses allocated to TORF:

1. Gas revenues due the State are a “pass through,” whereby LBGO does not hold the revenue due the State, but receives it into TORF and passes it on to the State within a few days.
2. Long Beach Unit – oil (City holds the net profits 60 days in TORF before transferring to the State, any interest incurred is passed to TOF)
 - a. Tract 1 net profits

- i. The State receives all the base net profit due Tract 1
- ii. The State receives 42.5% of the incremental net profit from OWPA
- iii. Oxy receives 49% of the incremental net profit from OWPA
- iv. The City receives 8.5% of the incremental net profit from OWPA – this amount goes to the Tidelands Operating Fund

LBU revenue was forecast based on the THUMS OWPA

b. Tract 2 net profits

- i. The State receives all the base net profit due from Tract 2
- ii. The State receives 51% of the incremental net profit from OWPA
- iii. Oxy receives 49% of the incremental net profits from OWPA
- iv. The City does not receive any net profits from Tract 2

No revenue to COLB - no forecast of revenue to COLB

3. West Wilmington – oil net profits

a. State

- i. The State receives 95% and Tidelands OPC receives 5% of all the base net profits
 - a) 80% of the value of the oil sales and 50% of the bonus
 - a) Tidelands OPC retains 50% of the bonus
 - b) 20% of the value of the oil sales and 90% of the bonus
 - a) Tidelands OPC retains 10% of the bonus
- ii. The State receives 49% of the incremental net profit from OWPA
- iii. Oxy receives 49% of the incremental net profit from OWPA
- iv. The City receives 2% of the incremental net profit from OWPA – this amount goes to the Tidelands Operating Fund

b. City TOF

- i. City receives 97% and Tidelands OPC receives 3% of all base net profits
- ii. The City receives 51% of the incremental net profit from OWPA – this amount goes to the Tidelands Operating Fund
- iii. Oxy receives 49% of the incremental net profit from OWPA

c. City Uplands

- i. City receives 99% and Tidelands OPC receives 1% of all base net profits
- ii. The City receives 51% of the incremental net profit from OWPA – this amount goes to the Uplands Operating Fund
- iii. Oxy receives 49% of the incremental net profit from OWPA

4. Reimbursed Expenses

I am not forecasting reimbursed expenses as these are not revenue streams, rather reimbursement of expenses

- a. City Staff time (as Unit expense) will not be a charge against TORF unless preapproved by the State

- b. City Staff time as a subsidence cost will be charged against TORF (usually on a 50/50 basis, the other half being charged against the Long Beach Unit) – the TORF expense is pre-approved once a year by the State Lands Commission
- c. Water Plants – City operates (owns) some of the water injection plants in West Wilmington and receives 4% administration overhead from costs of the operation of the plants
- d. AEGZ agreement – the agreement for West Wilmington that determines the charges for water injection (see glossary)

Net Oil Revenue

Legislatively, the City is the trustee for the State of California in the tidelands of Long Beach. The City owns the minerals in the ground and must transfer to the State the net proceeds after expenses. Tidelands OPC, the Field Contractor for West Wilmington, operates under the Long Beach Harbor Tidelands Parcel and Parcel “A” Oil Contract. Prior to the OWPA enacted in 2012, Tidelands OPC paid 95% of the net profits from the

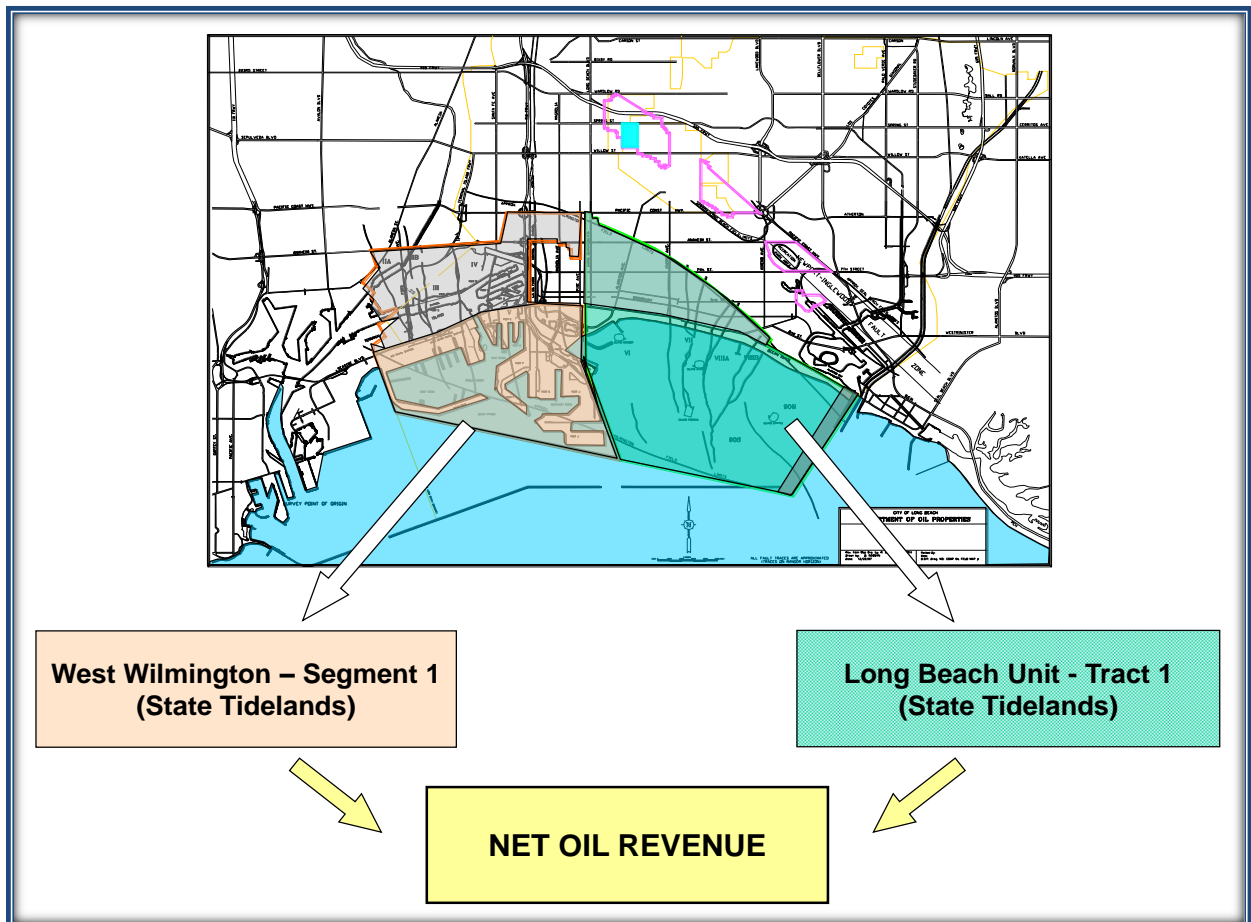


Figure 10 - Net Oil Revenue

Tidelands oil operations (Segment 1 of the Fault Block Units and the trust non-unit areas) to the City. The City does not retain this revenue, but must pass it on to the State. Tidelands OPC fronts all expenses for Segment 1, including the costs for injection for subsidence control purposes. Tidelands OPC can only recover the expenditures from the sale of crude oil, and if expenses are greater than revenues, Tidelands OPC carries the negative balance for the State (see Carried Working Interest Owner – glossary). Tidelands OPC is obligated to dispose of 80% of the oil produced from the tidelands and passes 50% of the bonus on to the City (on behalf of the State), Tidelands OPC retains 50% of the bonus. For the remaining 20% of the oil, Tidelands OPC passes 90% of the bonus onto the City (on behalf of the State) and Tidelands OPC retains 10% of the bonus. The City's trust abandonment costs are excluded from the net profits calculation (i.e., the City reimburses Tidelands OPC out of Long Beach Unit oil field revenues if oil revenues are inadequate to cover abandonment costs).

A 2010 OWPA between the City and Oxy modified the distribution of revenue for the City's holding in the Tidelands portion of West Wilmington. The City receives 97% of the base profit and shares the incremental profit 51% to the City and 49% to Oxy. In return, Tidelands takes all the capital investment risk and pays itself back only through the incremental profit. The City's base and incremental profit with flow to the Tidelands Operating Fund. This agreement also made the City a carried working interest owner.

The 2012 OWPA for the State's holdings in West Wilmington allowed incremental profit to be allocated to the City and Oxy. An agreed upon oil decline set the base oil production for the remainder of field life. The incremental profit is shared 49% to the State, 49% to Oxy and 2% to the City (Tidelands Operating Fund). The State continues to receive 95% of its base profits.

THUMS, agent for the Field Contractor – Oxy Long Beach Inc. (OLBI), operates under the Long Beach Unit Contractors' Agreement. Prior to the OWPA enacted in 1992, THUMS paid 95.5% of the net profits from 80% of Tract 1 (the City's trust portion of the Unit) to the City (on behalf of the State). Refer to Figure 6 for the remaining 20% non-operating Contracts to the City (on behalf of the State). In 1991, ARCO acquired the Non-Operating Contractors but still pays according to the original contract amounts. THUMS still receives 3% administrative overhead based on certain expenditures as defined in the Unit accounting procedures. THUMS fronts all expenses, including the costs for injection for subsidence control purpose and can only recover the expenditures from the sale of crude oil. During times of low oil prices or high expenditures, THUMS may carry a negative net profits account balance.

The City receives the State's net oil profits and, per agreement with the State, holds the revenues 60 days before transferring to the State. The interest that accrues in the

account is transferred to TOF. However, not all of this revenue is transferred to the State (read “reimbursed expenses”).

When Chapter 941, Sessions of 1991 and the ensuing OWPA for the Long Beach Unit, was enacted, some net profits from oil were now allocated to the City and Oxy. Chapter 941 also provided that the City would receive half of the interest earned on the Subsidence Fund (about \$4 million per year) from 1992 through 1999, and the State would receive half of the interest earned on the Subsidence Fund for the time period of 2000 through 2004. It provided that the incremental revenue to each of the parties would be split up in the following manner:

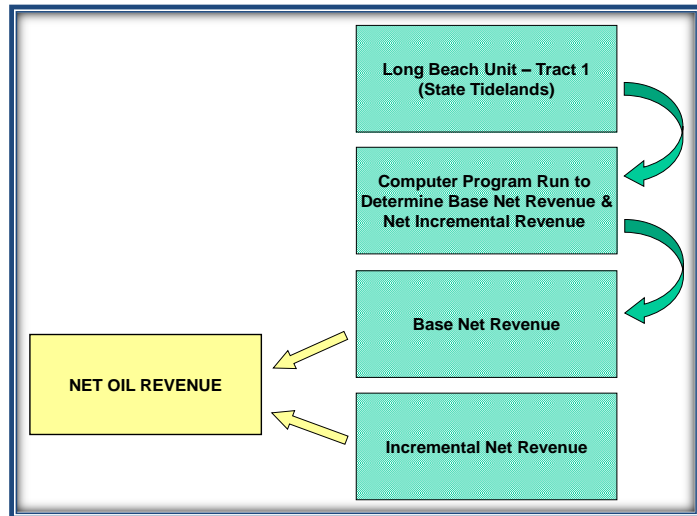


Figure 11 - OWPA Flow Chart

Years	State	Oxy	City
1992 through 1995	50%	50%	0%
1996 through 1999	46.25%	50%	3.75%
2000 and on	42.5%	49%	8.5%

Do I need to forecast the 8.5% COLB share of interest earned on the subsidence fund?

When Chapter 138, Statutes of 1964 (First Extraordinary Session), was negotiated in 1964, the City desired parts of the profits from the oil since the City would be responsible for the operations. The City did not want a variable net profit amount from the State tidelands; rather they opted for a declining but determined revenue stream from the operation. The amount is now \$1 million per year and is paid out of TORF to TOF, if sufficient funds are available. *This transfer occurs every December.*

The State also receives net profit from oil and gas sales from areas outside the Tidelands. In these instances, they are just like the City and other working interest owners (the net profits flow through the City first).

Other Oil Revenue

Figure 12 - Other Oil Revenue illustrates that the State does have some ownership in both West and East Wilmington that is not in the tidelands of Long Beach. This revenue is classified as “Other Oil Revenue,” and flows into TORF.

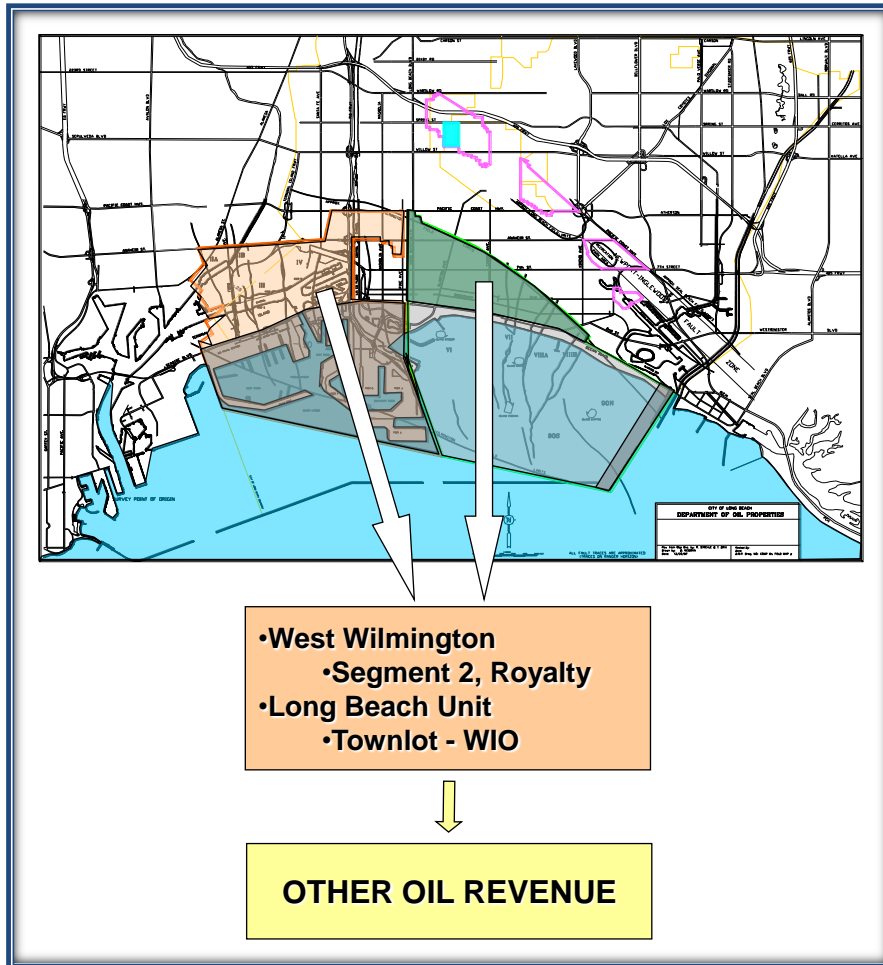


Figure 12 - Other Oil Revenue

Other Oil Revenue – Article 9

Figure 13 - Article 9 shows the case of the Long Beach Unit Contractors Agreement, under Article 9 of the Agreement (there is a separate document discussing Article 9). The State of California sought to ensure that oil price fixing would not happen, thereby lowering the price of oil and affecting the profits due the State. Originally, the Long Beach Unit Contractors agreement for Tract 1 had one operating contractor and five non-operating contractors. The Operating Contractor had control of 80% of the oil in Tract 1, but in reality it had ultimate control of only 67.5%, the remaining 12.5% could be sold by the State or by the City in separate contracts. The non-operating contractors controlled 10%, 5%, 2.5%, 1.5%, and 1% of the oil allocated to Tract 1, all in separate contracts. Each operator then sold the oil to the refiners, also in separate contracts with different terms. Wilmington crude oil price used to be posted by many of the refiners, but a contractor could receive a bonus above that price due to supply and demand, volumes of crude, timing of the market, etc. In Article 9, the total price of the crude was taken into account for all the contracts and an average price per month was calculated for each calendar month for one year. An invoice to the pricing of the crude is sent to the purchasers of the oil within nine months of the preceding year. The revenue is received usually in January and then distributed in February. Recent amounts have been a few hundred thousand dollars per year. The City's contractor is incentivized to maximize the value in which they sell the oil and therefore Article 9 has limited impact today. The City plans to work with the State to eliminate the Article 9 requirement.

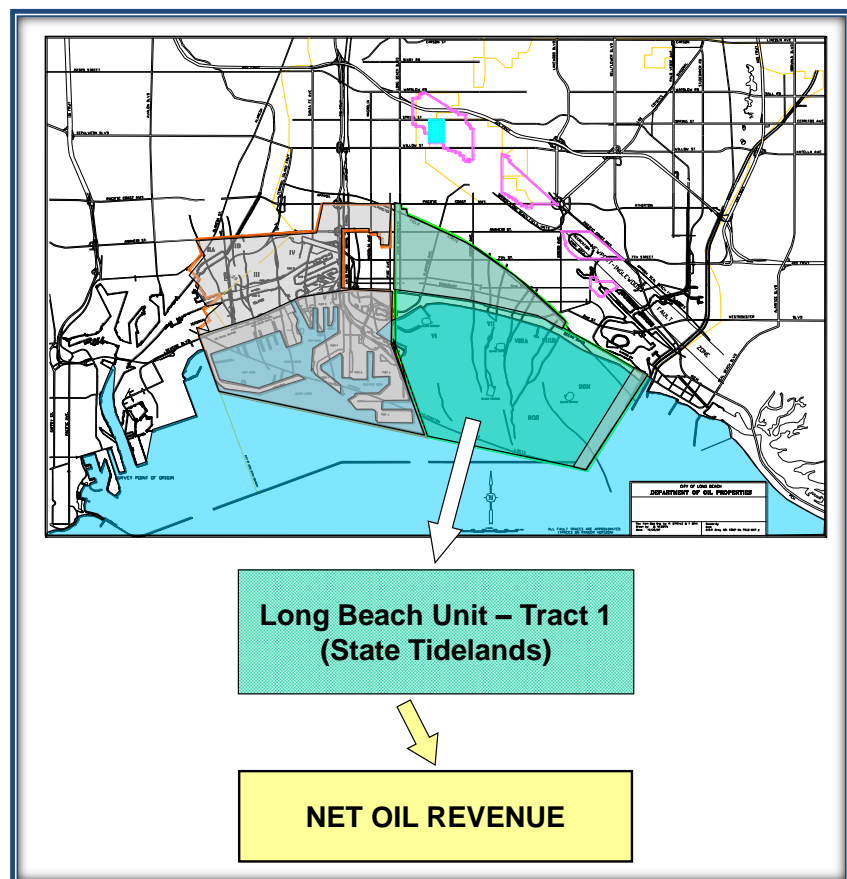


Figure 13 - Article 9

Prior to OWPA, the State received the revenue, but since the implementation of OWPA, the distribution is based on the split of base versus incremental net profits as determined for Tract 1 and 2 by month. So now, OLBI and the City receive some of the benefit for Article 9 from the incremental distributions.

Other Oil Revenue – Tract 2

The second piece of the State ownership in the Long Beach Unit is Tract 2. *Figure 14 - Other Revenue - Gas* illustrates the flow of net profit from Tract 2 into “Net Oil Revenue.” Tract 2 is also part of the Long Beach Unit OWPA, but the City does not share in the split or incremental net profits, rather the splits are only between the State and Oxy.

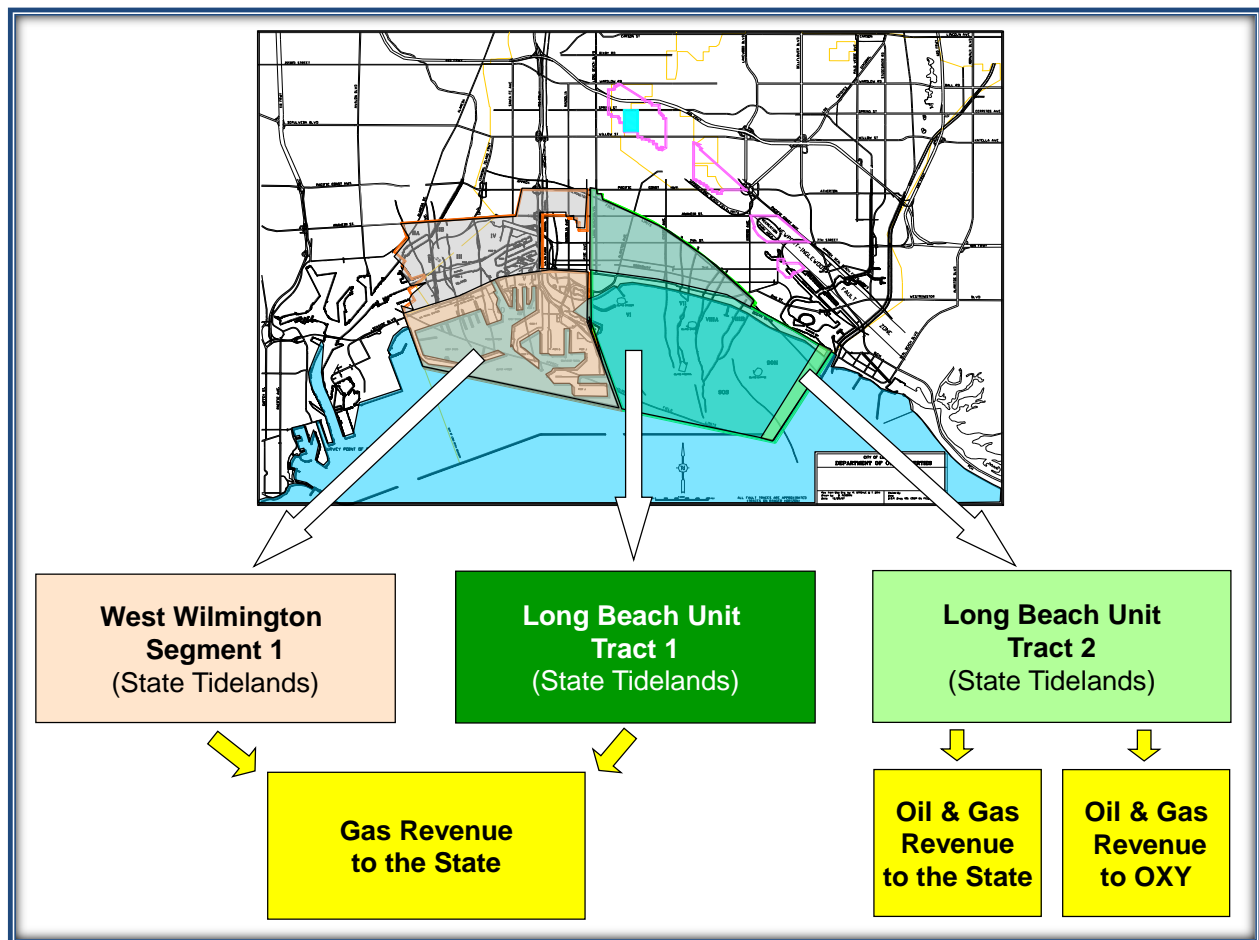


Figure 14 - Other Revenue - Gas

The net profits from the oil operations that are eventually due the State do end up into TORF, although how long those revenues stay in TORF can be different. Chapter 138 states that the net profit from oil production will be received by the City, but the City is only able to hold Tract 1 oil revenues for 60 days. As shown in *Figure 14 - Other Revenue - Gas*, the gas revenue from West Wilmington and Long Beach Unit (Tract 1 and Tract 2), along with the net oil revenue from Tract 2 (base and OWPA), is passed through TORF, but the funds are not held.

Other Revenue – Shallow Gas

In a similar way to the Tract 2 oil (*Figure 15 - Other Revenue - Shallow Gas*), all gas revenue allocated in the State Tidelands is passed directly to the State and is not held by the City. With the enactment of Chapter 29, gas revenue was separated out financially from the oil operations. Chapter 29 stated “the City of Long Beach (City) shall receive into the system of its municipal gas department all Long Beach tidelands dry gas that it can economically utilize.” In the Long Beach Unit, there are pockets of shallow gas (gas in portions of the reservoir above the oil producing zones) that have been left undeveloped. The contractor never sought out these gas zones because it did not receive any portion of the revenue. In 2005, the State, Oxy, and the City entered into a Shallow Gas agreement, which Oxy was given an incentive to develop the gas. The State is paid from a sliding scale (33% - 55%) royalty based on the price of gas sold (the higher the price of the gas, the higher the royalty due the State). The City receives a flat 15% of this gas revenue due the State. Shallow gas has all been shut-in since 2013 because of economics. [THUMS transfer files confirm gas still shut in](#)

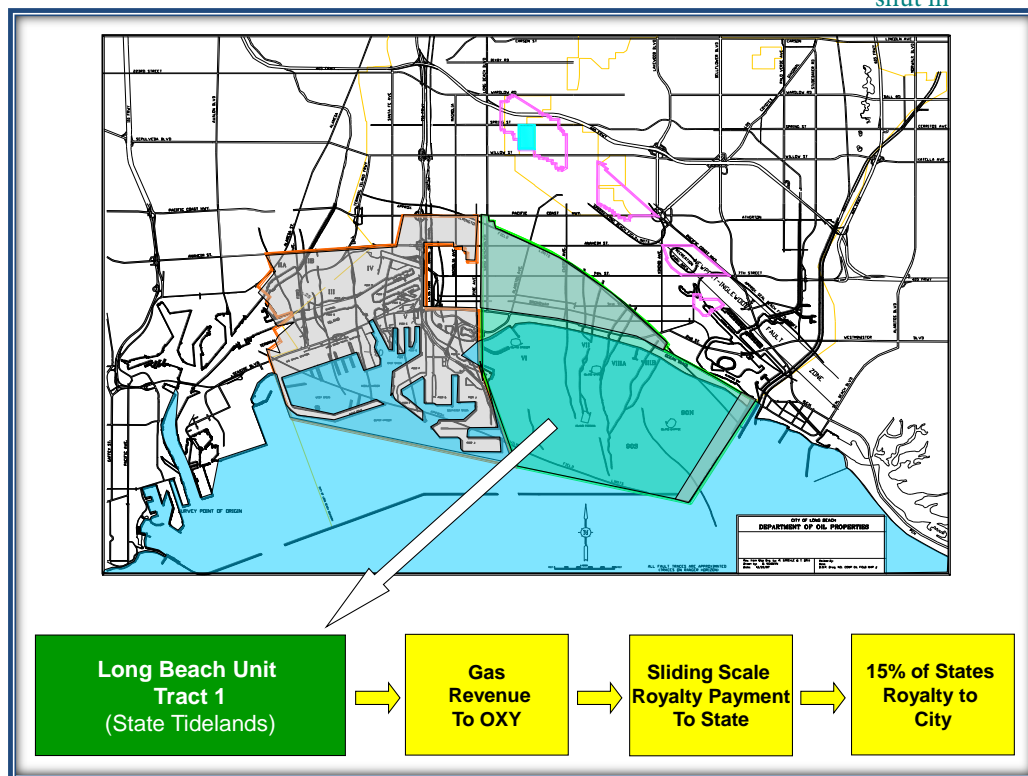


Figure 15 - Other Revenue - Shallow Gas

Uplands Fund

The Uplands Fund (SR 134) receives revenue from oil operations in a variety of ways. *Figure 16 - Uplands Fund Flow Chart* illustrates those revenues that flow into the Fund from a variety of sources such as Contractual Administration Overhead, Working Interest, Royalty Interests, and a recent contact – Belmont pass through royalty. The Uplands Fund pays for staff time in conjunction with work done that is not part of the Unit operations, but instead focused on the City’s uplands interests.

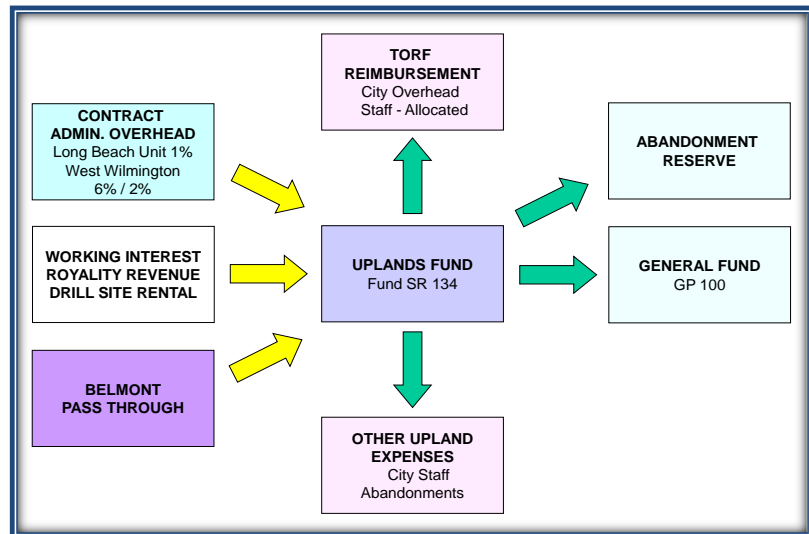


Figure 16 - Uplands Fund Flow Chart

Contract Administrative Overhead

- West Wilmington
 - Segment 1 & 2 – City receive 6% of expenses but transfers one-third of the 6% (or 2%) to Tidelands OPC *Previous write up stated transfer of 2/3rds.*
- Long Beach Unit
 - City receives 1% of expenses
 - THUMS receives 3% of expenses

Working Interest / Royalty / Drill Site Rental

- 13.7% Fault Block Unit IV (WIO)
- 8.1% - Fault Block V Unit (WIO)
- 0.7% - Long Beach Unit (WIO) *Confirm that this is included in the OWPA - LBU payment. If not, please provide copies of the last 12 revenue check detail statements covering this interest.*
- 9.8% in the Signal Hill East Unit (WIO) *SHPI SHEU and SHWU*
- 5.3% in the Signal Hill West Unit (RIO)
- 22.7% carried working interest and a 15.1% royalty interest in Recreation Park
- 6.8% in the Continental/Chevron leases (RIO) *CRC Pico Leases*
- 39.2% carried working interest in the City Wasem Community lease *E&T wells other than 8, 9, and 17)*

- 3.5% in the Alamitos Heights (RIO) E&T 8, 9,12, and 17
- 16% in Rose 12 (RIO) P&M well - producing but no payments (was operated by E&B)
- 16% in the Airport lease (RIO) Operated and paid by Signal Hill Petroleum
- 51% carried working interest of the incremental portion of Fault Block I – V
- Belmont Pass Through Royalty (see glossary) 2.5% royalty on all oil produced in Belmont offshore by Oxy

Administrative Overhead

Figure 17 - Administrative Overhead, illustrates how it flows into the Uplands Fund. It is stated in all the Unit Agreements that some staff positions can be charged as a Unit expense. In practice, we have not charged for staff at the Bureau Manager level or higher. Administrative overhead is designed to pay for that staff time as well as Director, City Manager, Mayor, and others that would devote only a portion of their time to the operations. Administrative Overhead is

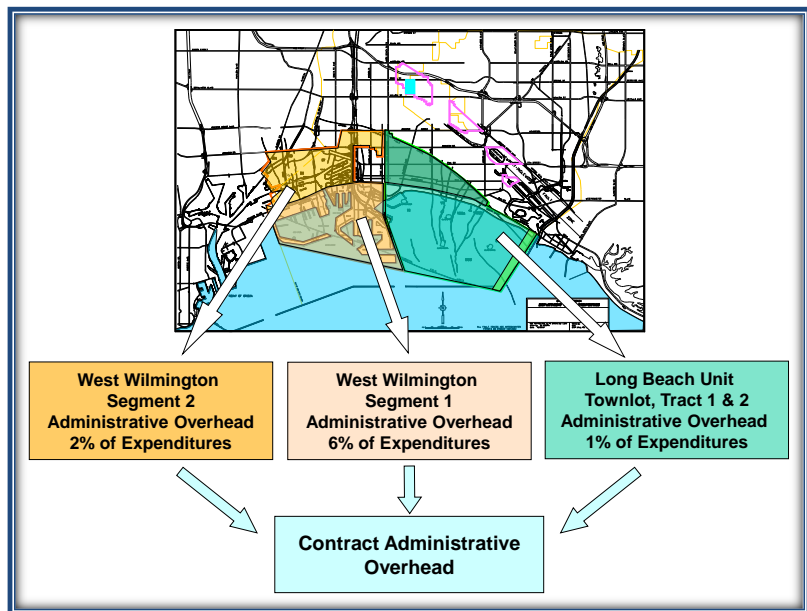


Figure 17 - Administrative Overhead

calculated as a percentage of total expense (excluding taxes, litigation, and water injection). In the West Wilmington, the City receives 6% of the administrative overhead in Segment 1. In Segment 2, the City also receives 6% of the administrative overhead, but pays to Tidelands OPC two-thirds of the 6%. This arrangement was set up in the late 1980's and early 1990's by the then owners of Segment 2 – UPRC and Mobil Oil. Both sought to utilize Tidelands OPC as a contractor and for reimbursement each company paid a portion of their administrative overhead. It was not until Mobil Oil quit claimed and UPRC was purchased by the Harbor Department, did the City receive the administrative overhead in Segment 2. In the Long Beach Unit, the City receives 1% of administrative overhead and the contractor receives 3%. This overhead amount is not completely independent from oil price. At higher oil prices, the investment in drilling and other discretionary expense is substantially higher than when oil prices are low. The current \$100 oil price has allowed the administrative overhead to average around \$18 million per year to the City.

In 2011, Tidelands OPC and the City agreed to fix the Administrative Overhead equally in Segment 1 and Segment 2 (City to receive 4% and Tidelands OPC to receive 2%). This change simplifies the accounting for the West Wilmington oil operations.

Uplands Revenue

Figure 18 - Uplands Oil & Gas Revenue illustrates the other major Uplands Revenue sources. The West Unit of Signal Hill Oil field is a royalty interest. The City gave up some of its royalty interest back in this Unit in the 1990's to gain ownership of land for parkland (Sports Park). The East Unit is a working interest ownership. A Central Unit does exist, but the City has no mineral interests. Recreation Park lease has a complicated royalty and working interest ownership, City Wasem is a carried working interest, and the City also receives a drill site rental payment from the lease for use of City land. *Is there a Cliff Notes on the Rec Park lease ownership? I haven't seen this. Is this above and beyond the 3.5% royalty?*

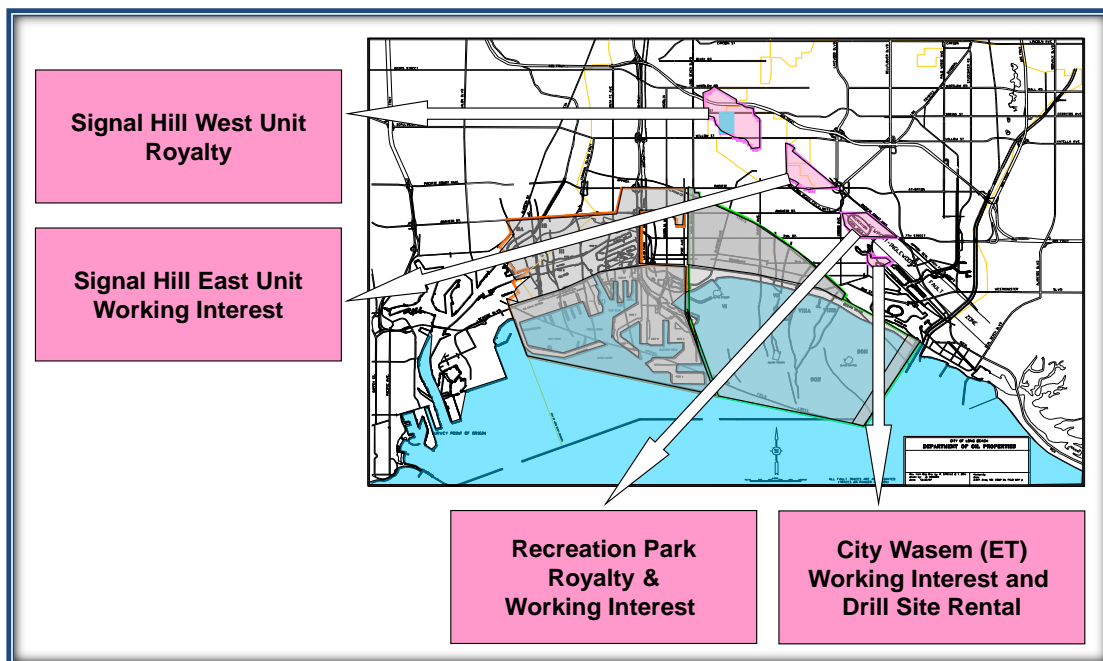


Figure 18 - Uplands Oil & Gas Revenue

There are a variety of other interests the City owns which are not shown in Figure 18. Most other interests are small working interest ownerships or royalty ownerships and can consist of a single well such as Rose 12. The City also receives a “pass through royalty” for land owned or controlled near the City Wasem lease and the Belmont offshore lease (PRC 186). For the Belmont offshore lease, Oxy had requested to utilize part of one of the Long Beach Unit islands to conduct drilling operations to an adjoining lease. One of the requirements imposed was the City would receive 2.5% royalty on the production to allow for this to occur. The Long Beach Unit owners are also compensated and are not impacted by the Belmont operations.

Revenues flowing into the Uplands Fund have a variety of sources throughout Long Beach. *Figure 19 - WIO Wilmington Oil Field* illustrates West Wilmington Fault Block IV and V, and the Long Beach Unit, with revenue two months following the month in which the oil and gas was sold. The City is also invoiced for the projected expenses the month prior in which they occur – a true up occurs each month. In 2012, the City became a carried working interest owner in Fault Blocks IV and V. Other working interest owners are carried by the contractor due to the expense of mailing out bills and the possibility that the working interest owners would actually not pay if invoiced.

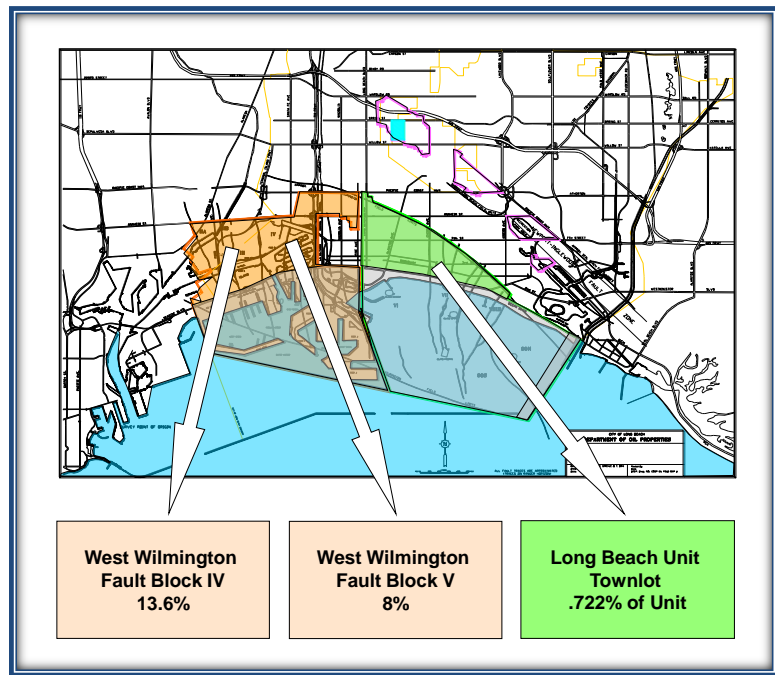


Figure 19 - WIO Wilmington Oil Field

In 2012, the City agreed to another OWPA for its Upland holdings in West Wilmington. The City receives 99% of the base profit and shares the incremental profit 51% to the City and 49% to Oxy. In return, Tidelands OPC takes all the capital investment risk and pays itself back only through the incremental profit. The City's base and incremental profit with flow to the Uplands Oil Fund.

The Long Beach Unit Townlot is considered a working interest and we pay the monthly expenses and receive all the revenue (not just the net profit) from our allocated share (we currently do not have a carried working interest for these interests).

Sounds like this is separate from the OWPA. Please provide 12 months of revenue interest payment detail statements

In 2002, Oxy was allowed to drill into an adjoining oil lease (PRC 186, or Belmont) from island Chaffee in the Long Beach Unit. Two contracts were needed to allow for this, the first being the Belmont Agreement, which has now been amended twice. This agreement allowed the use of the Long Beach Unit land, facilities, and drill rigs, and other equipment to operate Belmont. Oxy, in operating Belmont, would compensate the Long Beach Unit for any costs including water injection, oil handling and processing, and staff time to operate.

The second agreement between the City and Oxy was payment to allow for operation to take place. The second agreement called for a 2.5% royalty payment to the City on any oil sold from the Belmont operation (*Figure 20 - Belmont*).

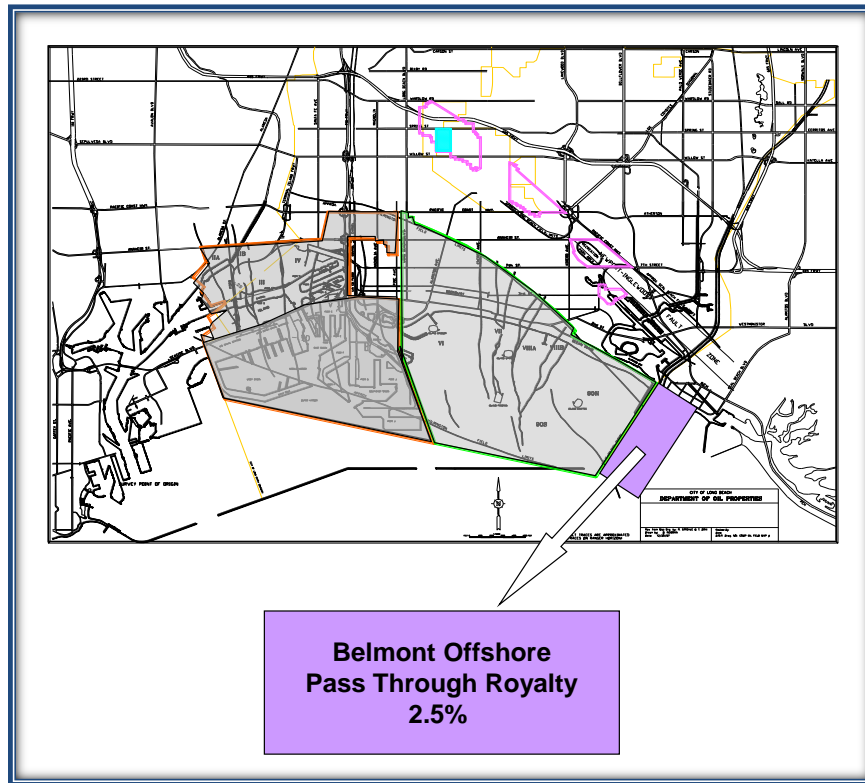


Figure 20 - Belmont

Abandonment Reserve

Each year, LBGO determines the abandonment liability of the City's interests. LBGO determines the funding amount each fiscal year, based on a price per barrel calculation. The abandonment fund receives its funding first, before any net profit is transferred to the General Fund. Prior to 2004, the City would retain a portion of the State's net profits for an abandonment reserve on behalf of the State. Now the State controls its own abandonment fund which is funded at \$300 million.

Please let me know how LBERD determines the funding amount (formula and example calculations from a few prior years. What is the current balance of the City's abandonment fund.

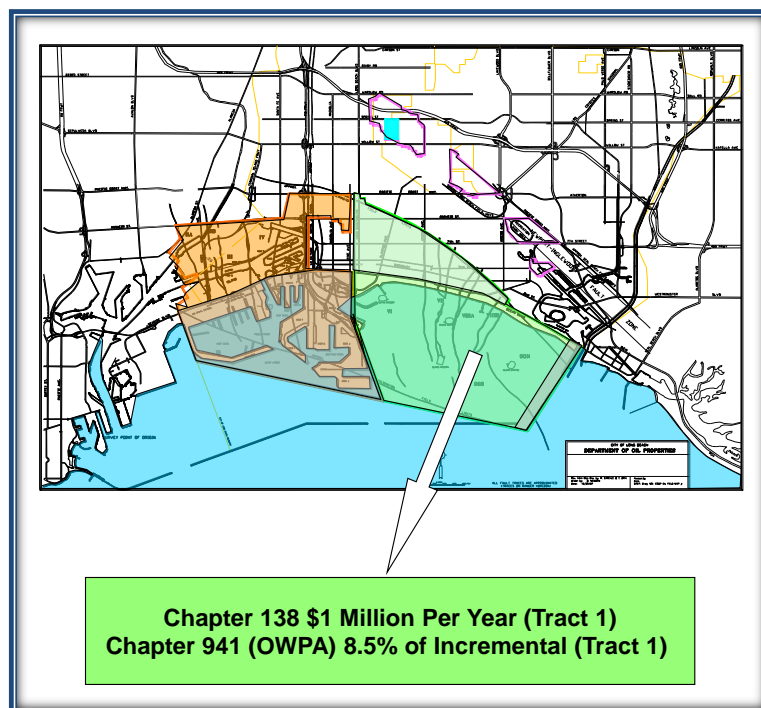
An abandonment fund in the Tidelands Operating Fund was established in 2010 for the oil field liabilities in West Wilmington. Previously, the Harbor Department had been receiving the revenue and had the abandonment liability in West Wilmington, but with the passage of Measure D, the revenues and liabilities were transferred to LBGO on behalf of the City.

Tidelands Operating Fund

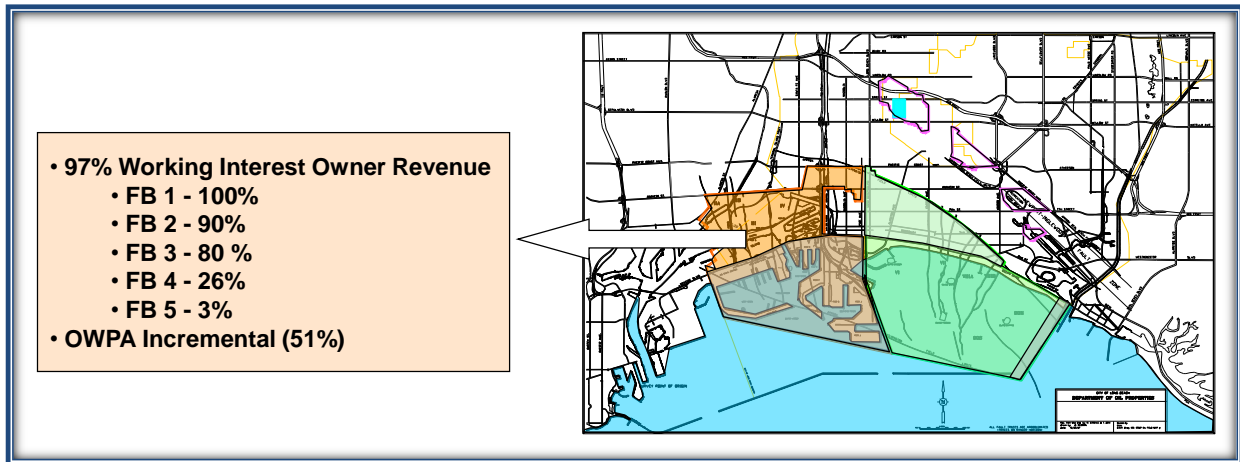
The Tidelands Operating Fund (TOF) is similar to the Harbor Revenue Fund whereby both are trust funds and the revenue cannot be used outside the tidelands trust areas.

As discussed previously, Chapter 138, Statutes of 1964 (First Extraordinary Session), was designed for the development of offshore oil reserves within the Long Beach Tidelands east of the existing oil operating areas. Chapter 138 proceeded to set forth the portion of tidelands oil revenue which the City would retain, by providing that the City would keep 50% of remaining oil revenue, as contemplated by Chapter 29, until December 31, 1967. The amount would decrease each year by a certain percentage or total amount, until the calendar year 1988, at which time the City's share amounted to \$1 million each year. The City's share of remaining tidelands oil revenue per Chapter 138 is now fixed at \$1 million per year.

In 1991, the California Legislature passed AB 227 (Chapter 941, Statutes of 1991). This law became effective on October 13, 1991. AB 227 amended Chapter 138, to allow for then, ARCO, with the City, to design and implement an optimized waterflood program. The State was guaranteed a base case (computer model of expected oil production over the life of the field), and any incremental oil production above that base case would be shared by the City, State, and ARCO. The percentages are now set, with the City to receive 8.5%, State 42.5%, and Oxy 49%. Since this incremental revenue is confined to tidelands, the City's portion flows into TOF (*Figure 21 - Tidelands Operating Fund (TOF) East Wilmington*).



In November 2009, the City and Oxy signed a similar OWPA (which began on January 1, 2010) for the portion of the West Wilmington Oil Field that was purchased by the City in 1994 from UPRC. With the creation of West Wilmington OWPA, incremental net profit also will flow into TOF (*Figure 22 - Tidelands Operating Fund (TOF) West Wilmington*). This West Wilmington OWPA is different from the Long Beach Unit OWPA, in that the City receives the base revenues and 51% of the incremental instead of the State.



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Force protection of tidelands trust facilities to be a trust charge and not borne exclusively by the City.

Chapter 138 imposed the following condition to net profits from oil that went into TOF from TORF:

As to any expenditure of oil revenue for a capital improvement involving an amount in excess of fifty thousand dollars (\$50,000) proposed to be made under subdivisions (a) to (f), inclusive, of this section, the City of Long Beach shall file with the State Lands Commission an adequate detailed description of such capital improvement not less than 60 days prior to the time of any disbursement therefore, or in connection therewith. Said description shall specify, in addition, the particular subdivision or subdivisions of this section which the city deems applicable and its

reasons, if necessary, for regarding such expenditure as being so authorized. The commission shall have 60 days after the time of such filing within which to notify the city that such capital improvement is not authorized by any of such subdivisions. In the event the commission so notifies the city, a copy of the opinion of the Attorney General (or other legal counsel of the commission) upon which such disapproval has been based shall be delivered to the city. In the event the commission notifies the city that such capital improvement is not authorized, the city shall not disburse any oil revenue for or in connection with said capital improvement for a period of 30 days following such notice, during which period or afterwards the State Lands Commission may seek any judicial relief in any court of competent jurisdiction which it deems appropriate. In order to carry out the purposes of this section and to effect a speedy determination of any disagreement between the city and the commission, the Superior Court of the State of California for the County of Los Angeles (in the event such proceeding is filed in said court) shall give any proceeding filed by the city of State under this section priority over other civil matters.

Chapter 941, Statutes of 1991, modified the language above to increase the limit to \$100,000. Similar language is in the City Charter under Section 1710:

With prior approval of a majority of all members of the City Council, money credited to the Tideland Operating Fund may be expended for the purpose of performing services defraying operating and maintenance costs, making repairs, additions and betterments, making land acquisitions, constructing improvements, and for other related purposes, all as authorized by Chapter 676, Statutes of 1911, Chapter 102, Statutes of 1925, Chapter 158, Statutes of 1935, Chapter 29, Statutes of 1956, First Extraordinary Session, and Chapter 138, Statutes of 1964, First Extraordinary Session.

With the passage of Measure D, the City Charter language is clarified giving the City Council, through LBGO, the control of all oil operations the City owns and is trustee for, or is, the Unit Operator.

For the net profits from oil concerning West Wilmington, the following conditions apply:

- State Tidelands (Segment 1) –the net profits that flow into TOF would be subject to the Chapter 138/941 constraints.
- Segment 2 (west – City owned) – all oil net revenue will go into TOF and will be constrained by Chapter 138/941. The City receives 97% of the base revenues and 51% of the incremental revenues.

- Segment 2 (east) – if City owned, these net profits from oil will continue to go to the Uplands Fund.
- Payments from either Tidelands OPC or THUMS Long Beach Company for land rental or pipeline leases will go into TOF and not be constrained by Chapter 138/941.

ADDITIONAL REVENUE

There are a number of revenue streams to the City from the oil operations that do not pass through LBGO. It is assumed that all revenues below (excluding Water Purchases) flow into the General Fund; most are listed below:

- Utility Users Tax (FM) - Electricity, Gas, Water - \$2 million plus
- Barrel Tax - \$5 million (FM) (base of \$.15 and an additional \$.25 that is adjusted for COLA [currently at \$0.28])
- Sales Tax - (FM) *I need data on this tax.*
- Property / Mining Rights Tax - \$2 million plus (FM)
- Water Purchases - \$1 million (Water Department) *I need numbers relative to this revenue stream.*
- Well Permitting Fees - existing wells (\$240 per year) and new wells (\$1,185) (DS)
- Interest on Abandonment Fund (FM) *I need numbers relative to this revenue stream.*
- Use of the Subsidence Fund (FM) *I need numbers relative to this revenue stream.*

REGULATIONS, CONTRACTS, STATUTES

Regulations

Subsidence Control Act of 1958	7
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Chapter 138, Statutes of 1964 (First Extraordinary Session)	11, 18, 25
Chapter 158, Statutes of 1935	6
Chapter 676, Statutes of 1911	6
Chapter 941, Statutes of 1991	11

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GLOSSARY

AEGZ Agreement – The agreement for West Wilmington that determines the charges for water injection. The letters AEGZ denote the location by piers where the water plants are near.

Barrel – An oilfield measurement of volume equivalent to 42 U.S. gallons.

City Proprietary – The City's General Fund financial interest.

Carried Working Interest Owner (also see Working Interest Owner) – For a fee to the contractor (usually a cut of the Working Interest Owners net profit), the Carried Working Interest Owner will receive the net profits two months after the month in which they occurred. The Carried Working Interest Owner will not go negative (if expenses are greater than revenue) as in a straight WIO case, the contractor will carry the negative.

Fault Block – A section of the earth's crust bounded by faults.

Fault Block Unit – A fault block which has been Unitized (See Unitization).

Non-Operating Contractor – A Contractor in the LBU with a financial stake of less than 20% of Tract 1. The LBU Field Contractor has an 80% stake in Tract 1, and has the exclusive right to operate the field.

Oil Operating and Subsidence Control Areas – Surface areas dedicated for long-term oil production and for subsidence control. Subsidence control wells may be used either for injection or pressure monitoring. Subsidence control wells will be necessary after oil production has ceased and until such time that reservoir pressures have stabilized and the threat of subsidence is negligible.

Pass Through Royalty – A royalty payment negotiated to allow oil to flow from one oil operation to another.

Primary Depletion – The production and recovery of hydrocarbons by utilizing natural reservoir energy. Typical primary recovery will reduce reservoir pressures to a low value. Secondary recovery methods through pressurization of the reservoir, such as water flooding, may be considered following primary depletion.

Rebound – The minor (relative to subsidence) raising of the land surface due to increasing pressures within oil reservoirs.

Reservoir – A contained hydrocarbon bearing porous rock with permeability that will allow fluids to move through it.

Royalty Interest Owner – A mineral owner who leases the mining rights to another for development. The Royalty Interest receives a negotiated percentage of the total revenue from the mineral development of its lease and is not assessed an expenses.

Subsidence – A measurable surface elevation loss due to subsurface compaction. Subsidence can occur due to a number of reasons including groundwater withdrawal, sediment compaction, surface loading, and oil and gas production.

Subsidence Fund – Established by state legislation, “Reserve For Subsidence Contingencies,” Chapter 138. Allowed \$2 million per year, exclusive of interest, for 20 years to be accumulated in reserve. Impounded by the City of Long Beach, the fund is to be available to indemnify and hold harmless the City of Long Beach, the State of California, and any and all parties to the contractors’ agreement from claims, judgments and costs of defense, arising from subsidence alleged to have occurred as a result of oil operations.

Subzone – A term used to describe a thinner interval within a zone; a subset of a zone.

Tidelands – An area offshore that was granted to the City of Long Beach in trust by the State of California from 1911 to 1935.

TOF – The Tidelands Operating Fund, which pays to operate and maintain the beaches, waterways, marinas, and related tidelands activities.

TORF – The Tidelands Oil Revenue Fund, which accumulates all tidelands net oil revenues, pays specific oil field and administrative expenses, and from which the State receives its remaining oil revenues.

Unconsolidated Oil Sands – Those oil containing formations which have a consistency more like beach sand than a sandstone rock. The individual sand grains within a sandstone rock have been “cemented” to each other.

Unitization – The pooling of oil and gas leases to form one operating area with a single operator to ensure the maximum economic recovery of hydrocarbons. A Unit Agreement codifies equitable sharing of expenses, revenue, and profit of all working and royalty interest owners.

Water Injection Plants – The initial water injection plants installed in the 1950’s in West Wilmington were done at the expense of the City. The City has been paid back for the initial expenses but still retains a 6% administrative overhead on the operation of the water injection plants.

Waterflooding – A method of recovering additional oil by injecting water into the oil reservoir and sweeping the oil toward producing wells.

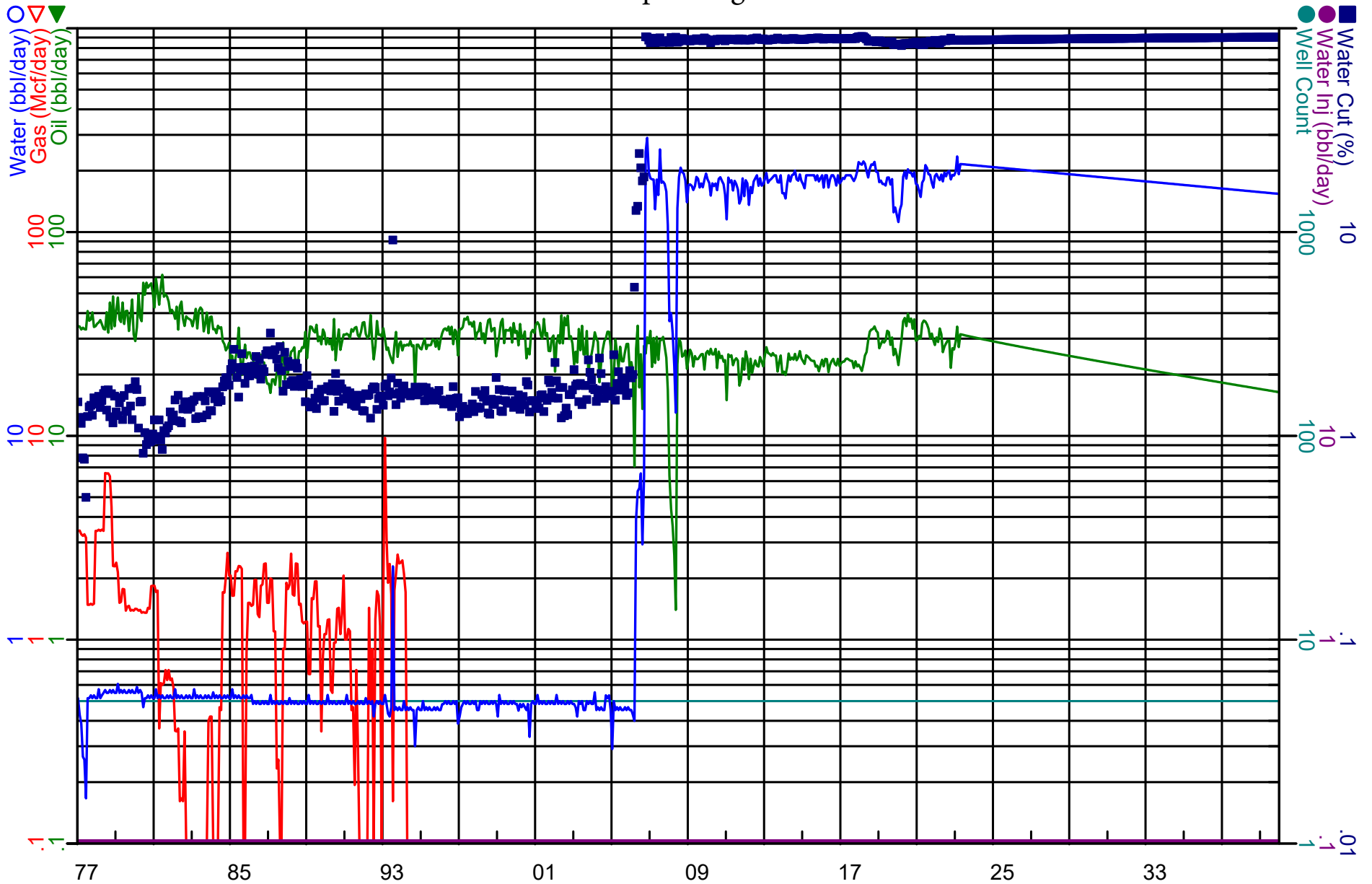
Working Interest Owner – (WIO) A stakeholder within a Unit that has an equitable share of all revenue and expenses from an oilfield operation. A WIO will normally front expenses (for example, in January, a WIO will pay for expected expenses in February), and receive the revenue two months after the fact (January revenues will be received in March).

APPENDIX B

Exhibit 1

Historical and Forecast Production

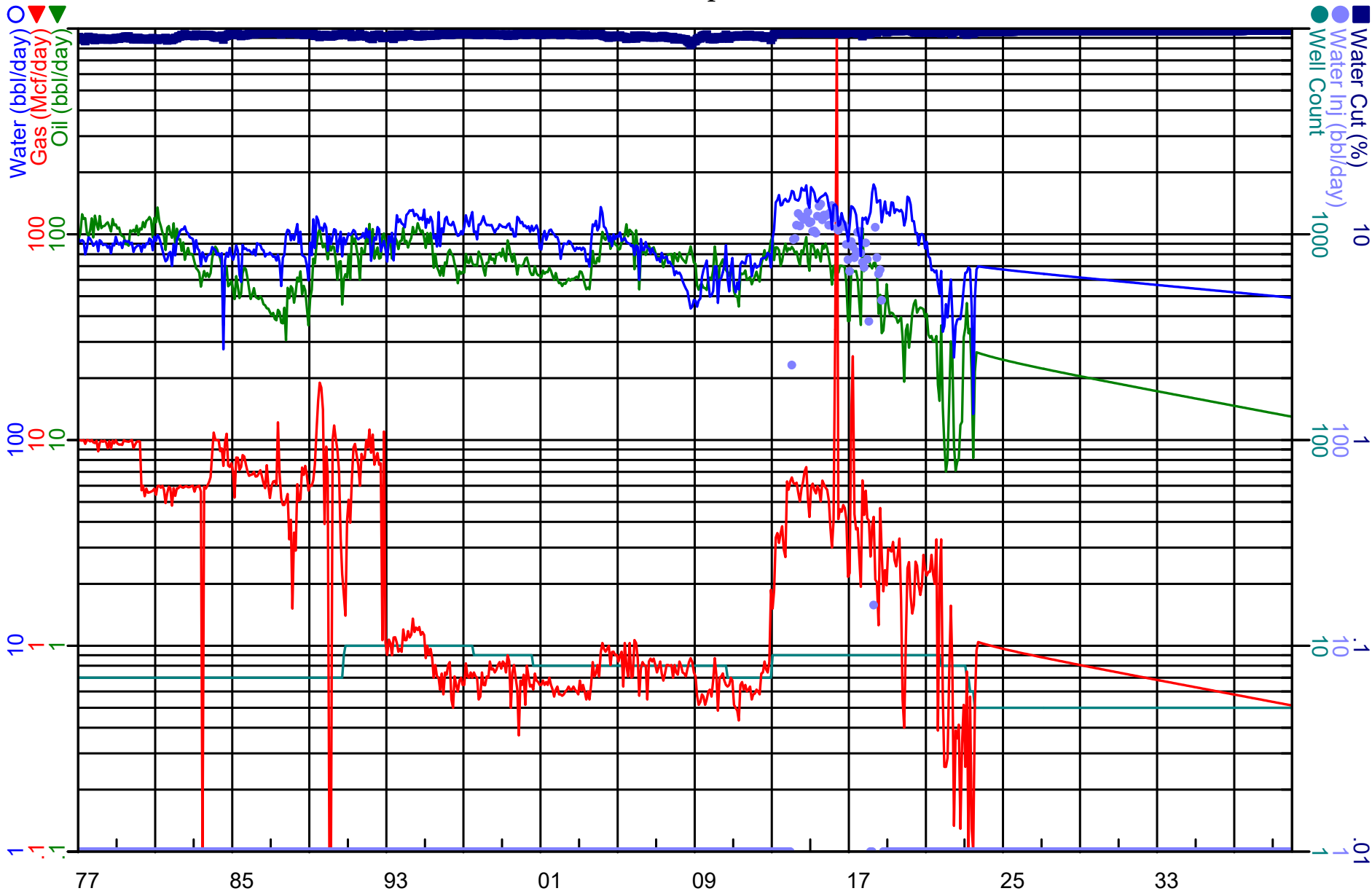
Arrowhead Operating - All Wells



Proj Oil Cum: 503.04 Mbbbl
Oil Rem: 253.01 Mbbbl
Oil EUR: 756.05 Mbbbl

Proj Gas Cum: 9.11 MMcf
Gas Rem: 0.00 MMcf
Gas EUR: 9.11 MMcf

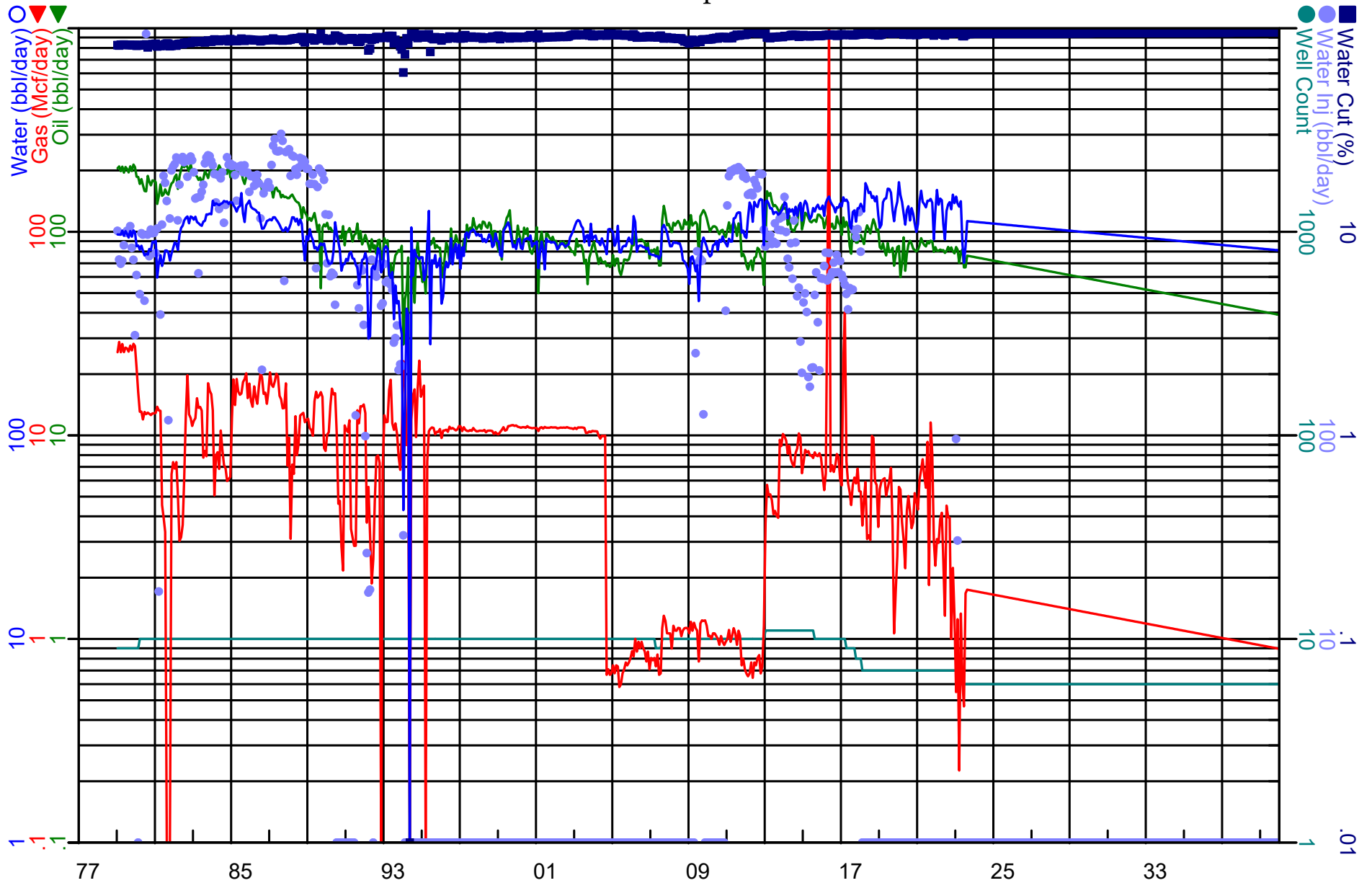
Exhibit 2 Historical and Forecast Production California Resources Corporation - N1C Lease



Proj Oil Cum: 1,231.63 Mbbbl
Oil Rem: 194.87 Mbbbl
Oil EUR: 1,426.50 Mbbbl

Proj Gas Cum: 95.24 MMcf
Gas Rem: 7.70 MMcf
Gas EUR: 102.93 MMcf

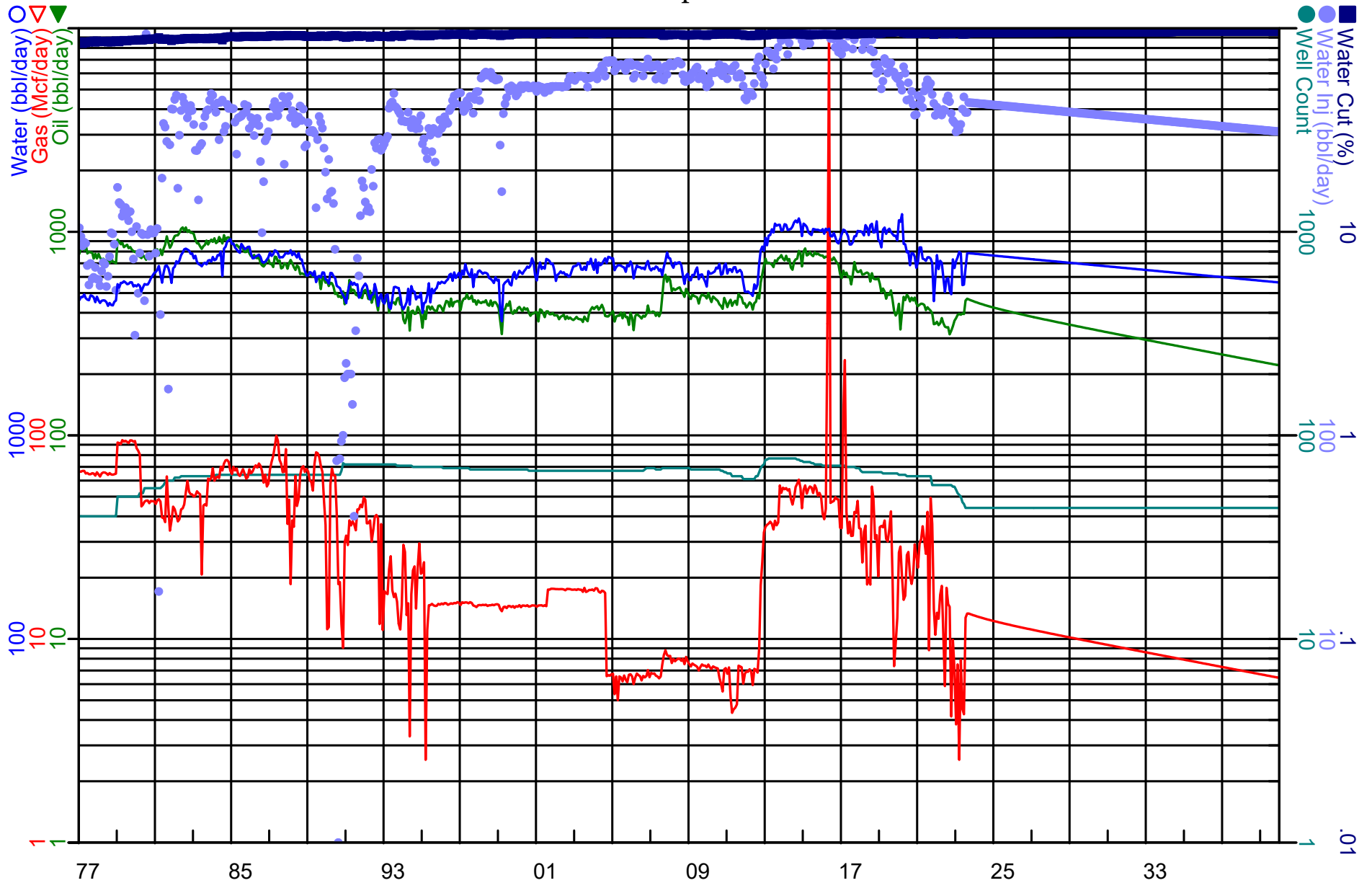
Exhibit 3 Historical and Forecast Production California Resources Corporation - N3C Lease



Proj Oil Cum: 1,830.90 Mbbbl
Oil Rem: 585.08 Mbbbl
Oil EUR: 2,415.97 Mbbbl

Proj Gas Cum: 187.99 MMcf
Gas Rem: 13.38 MMcf
Gas EUR: 201.37 MMcf

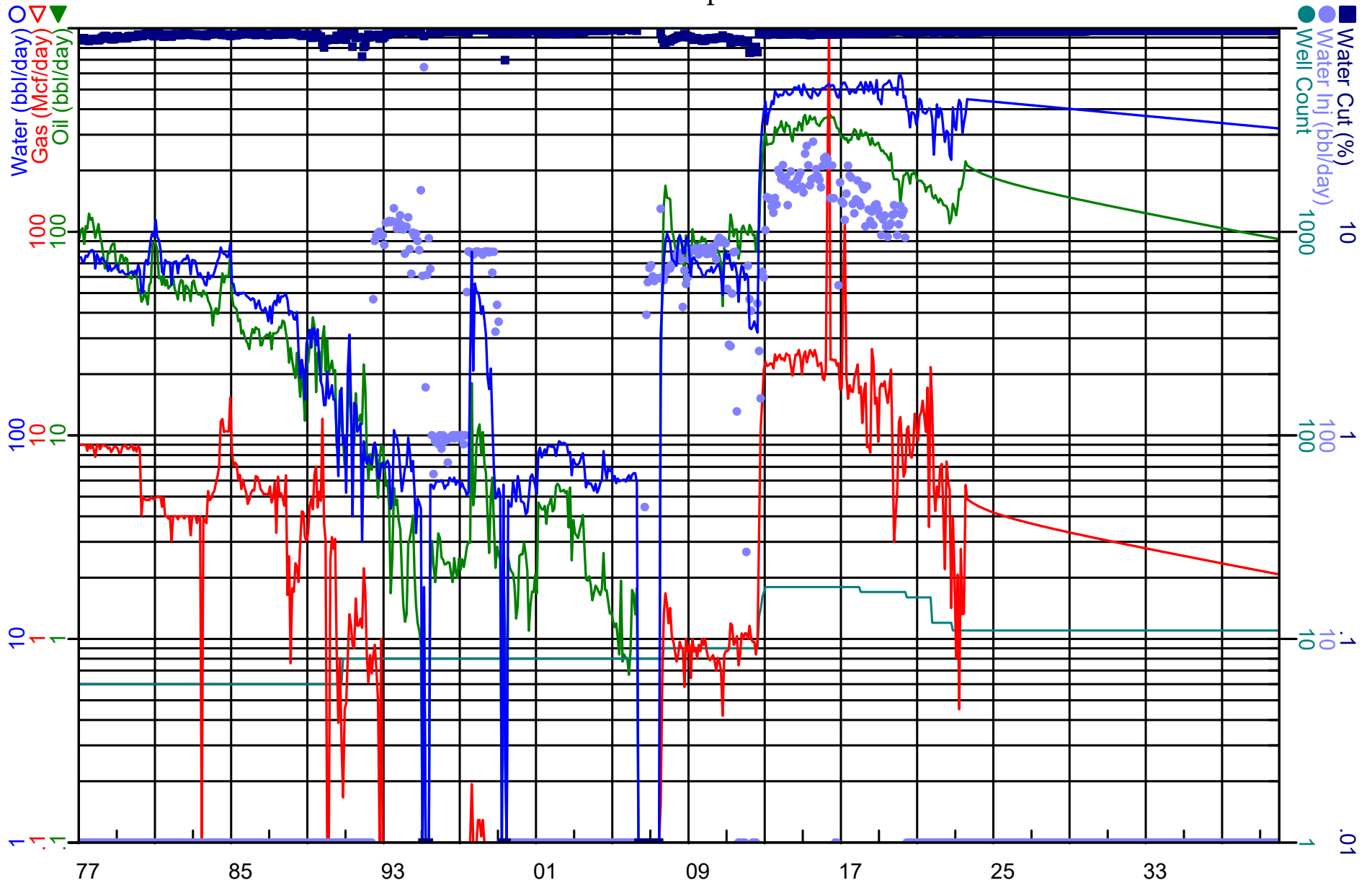
Historical and Forecast Production California Resources Corporation - All Pico Wells



Proj Oil Cum: 9,761.14 Mbbbl
Oil Rem: 3,337.19 Mbbbl
Oil EUR: 13,098.32 Mbbbl

Proj Gas Cum: 893.88 MMcf
Gas Rem: 96.90 MMcf
Gas EUR: 990.78 MMcf

Exhibit 5 Historical and Forecast Production California Resources Corporation - S1C Lease



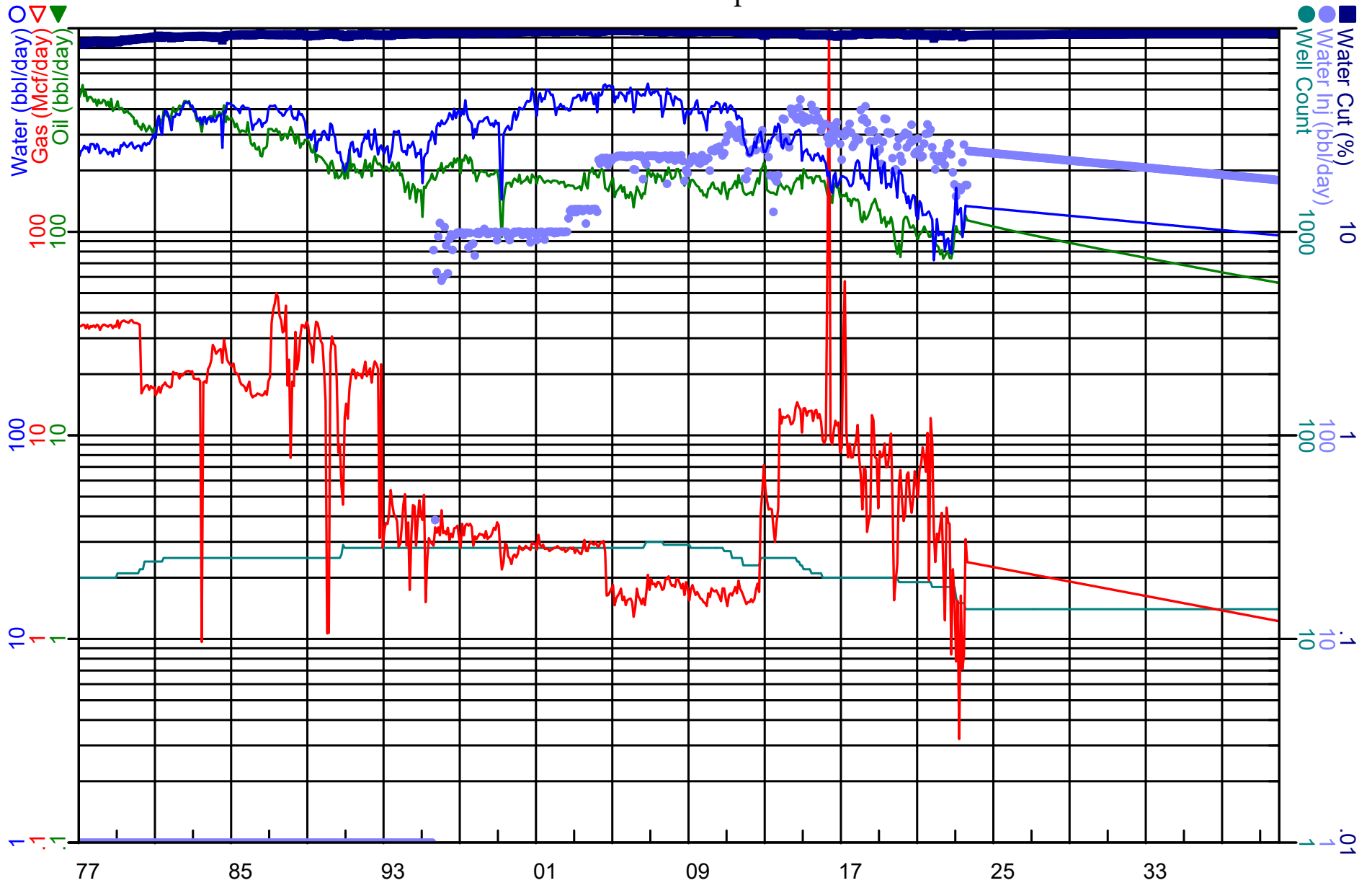
Proj Oil Cum: 1,491.16 Mbbbl
Oil Rem: 1,395.47 Mbbbl
Oil EUR: 2,886.63 Mbbbl

Proj Gas Cum: 268.85 MMcf
Gas Rem: 31.54 MMcf
Gas EUR: 300.39 MMcf

Exhibit 6

Historical and Forecast Production

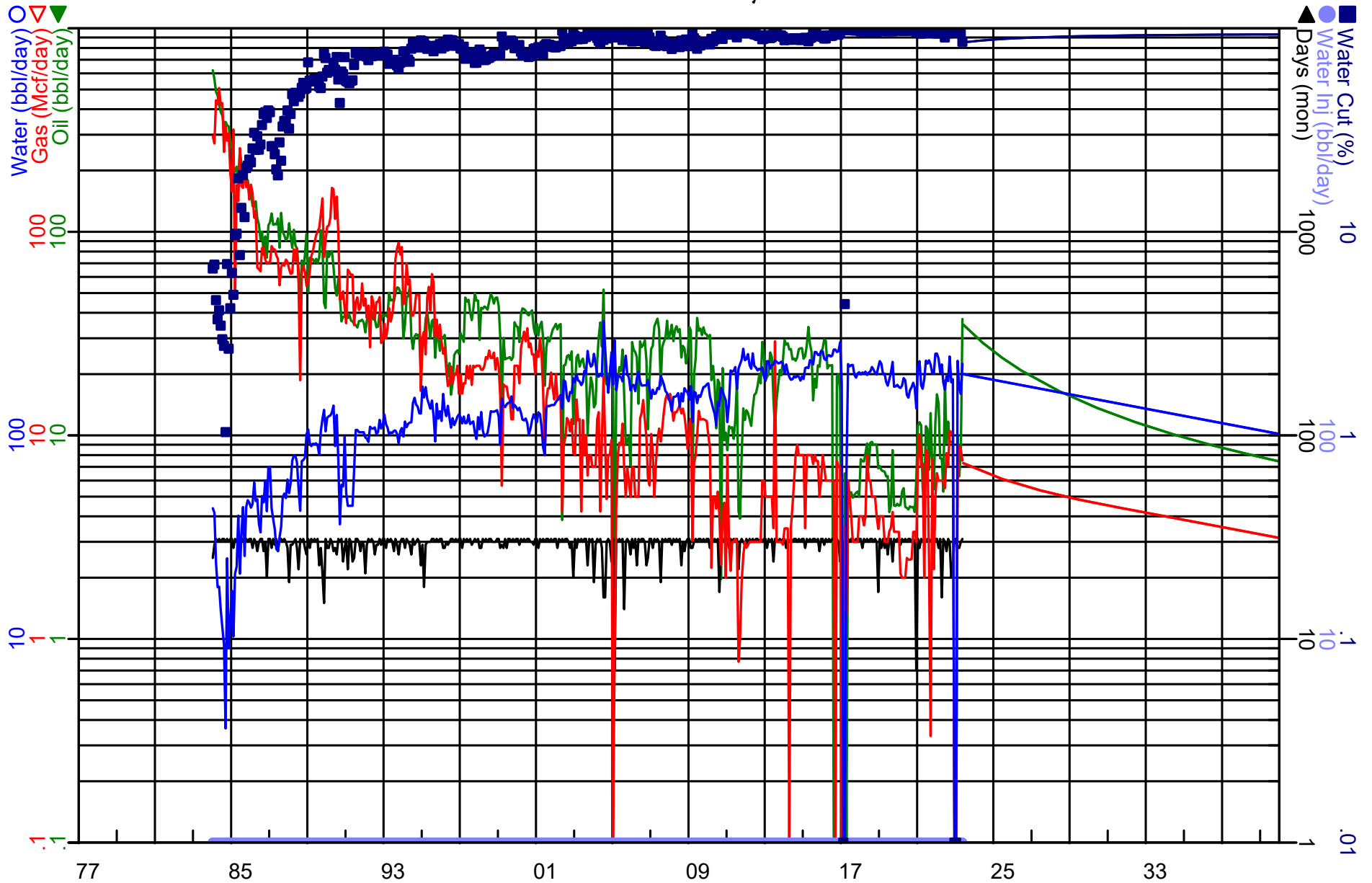
California Resources Corporation - WPU



Proj Oil Cum: 3,716.38 Mbbbl
Oil Rem: 852.02 Mbbbl
Oil EUR: 4,568.40 Mbbbl

Proj Gas Cum: 256.25 MMcf
Gas Rem: 18.28 MMcf
Gas EUR: 274.53 MMcf

Exhibit 7 Historical and Forecast Production Elliott and Ten Eyck 8



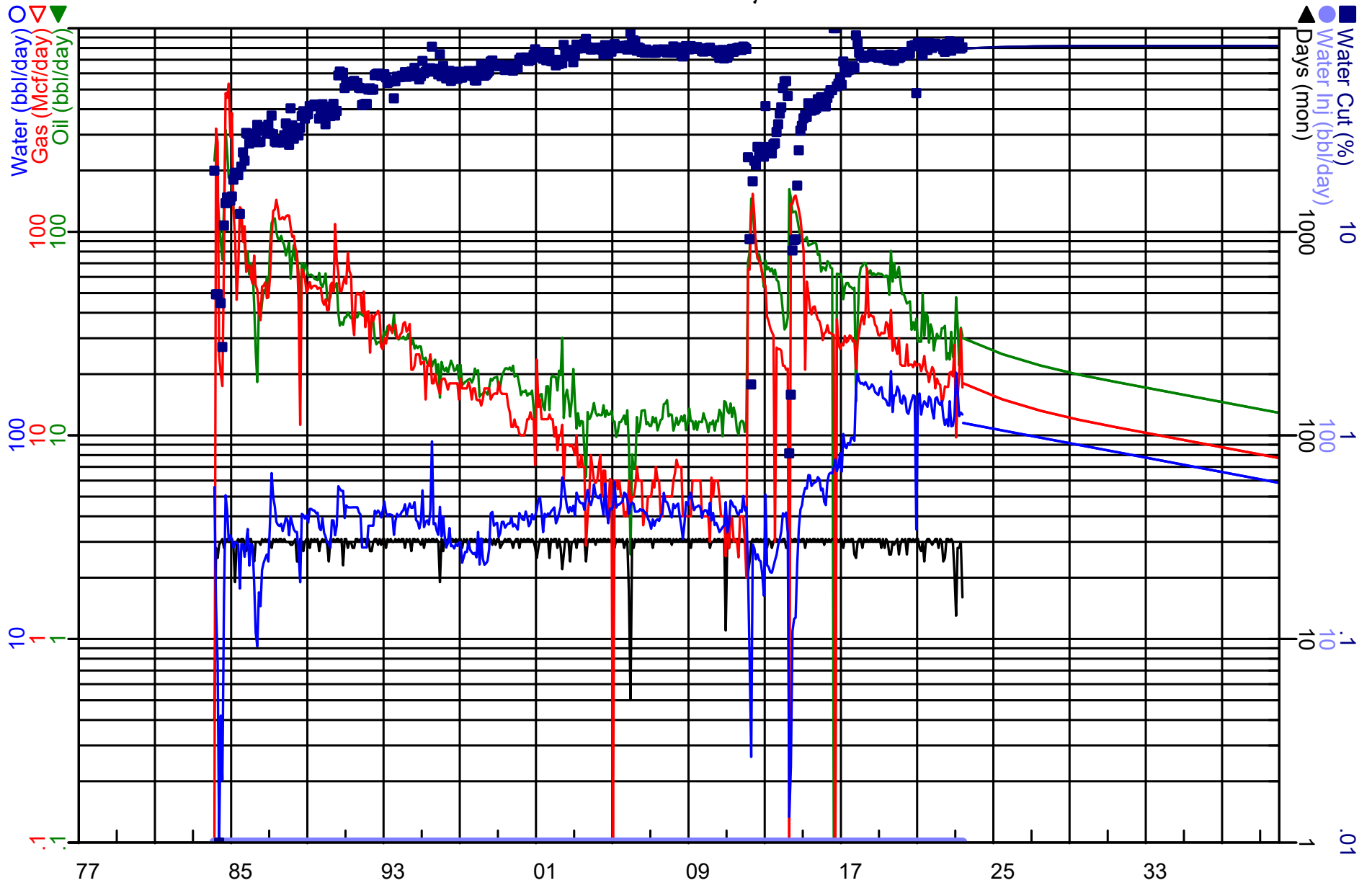
Proj Oil Cum: 646.73 Mbbbl
Oil Rem: 112.24 Mbbbl
Oil EUR: 758.97 Mbbbl

Proj Gas Cum: 511.41 MMcf
Gas Rem: 39.43 MMcf
Gas EUR: 550.85 MMcf

Exhibit 8

Historical and Forecast Production

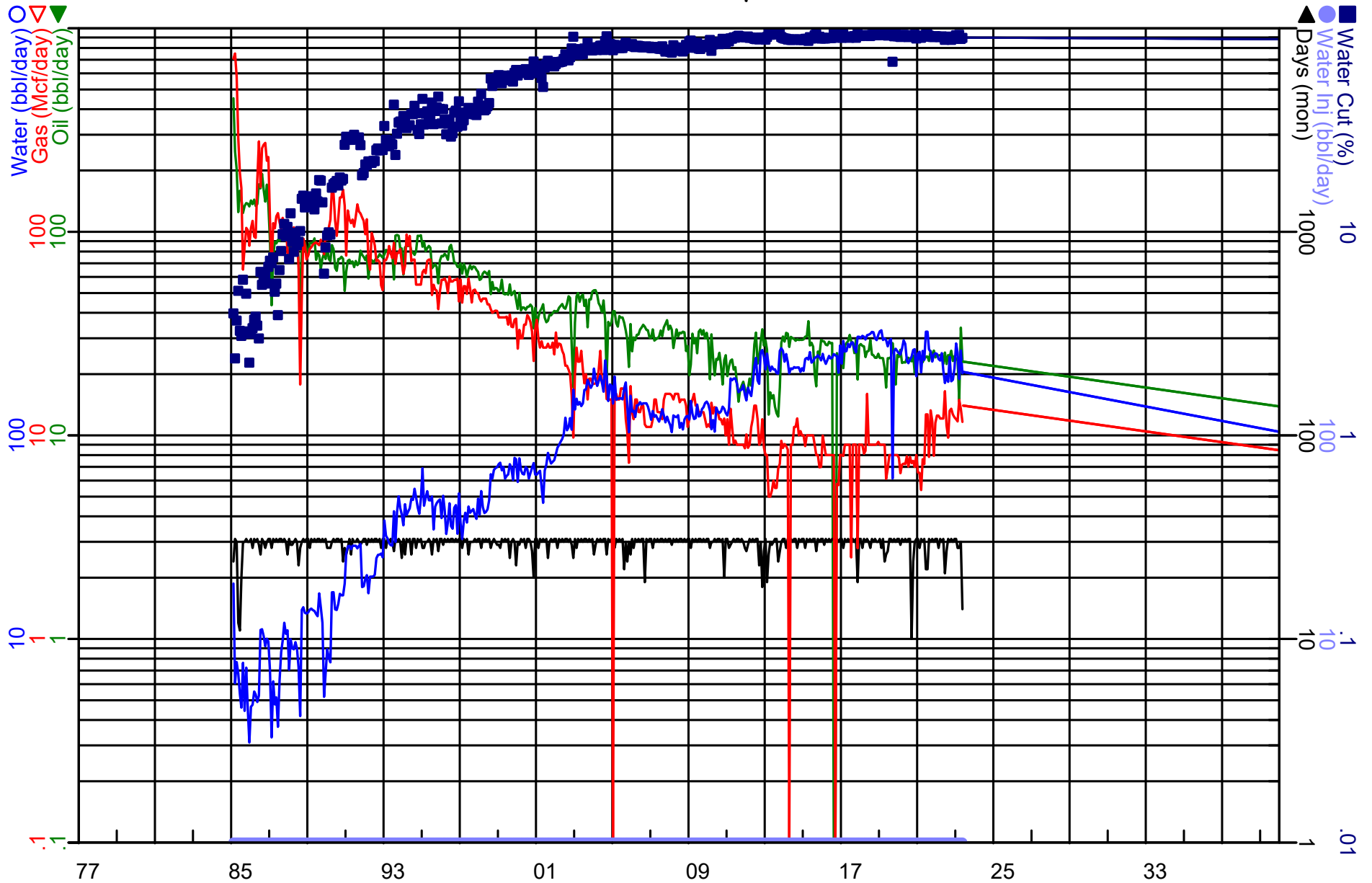
Elliott and Ten Eyck 9



Proj Oil Cum: 590.75 Mbbbl
Oil Rem: 190.61 Mbbbl
Oil EUR: 781.36 Mbbbl

Proj Gas Cum: 513.18 MMcf
Gas Rem: 114.37 MMcf
Gas EUR: 627.54 MMcf

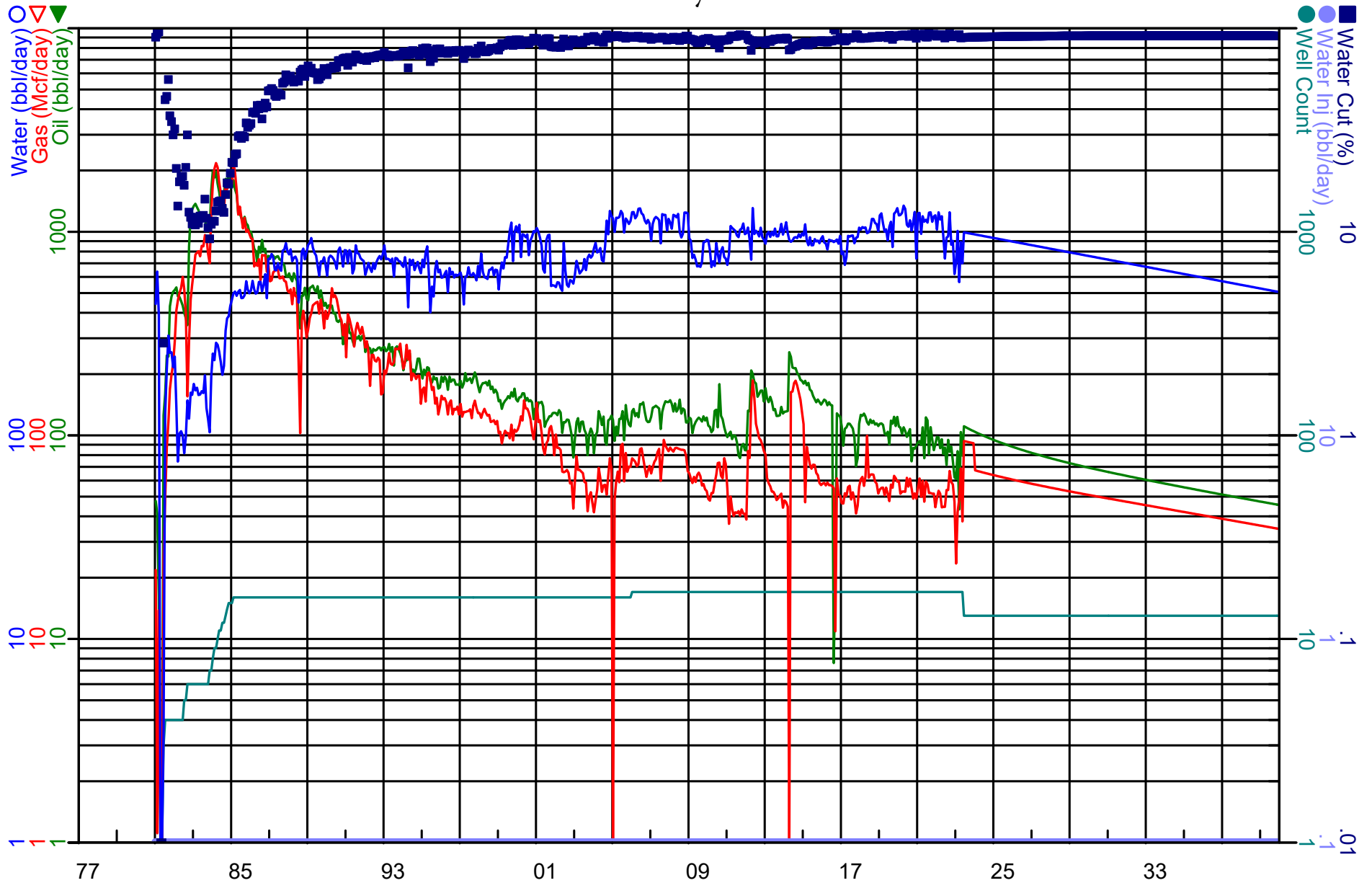
Exhibit 10 Historical and Forecast Production Elliott and Ten Eyck 17



Proj Oil Cum: 698.29 Mbbbl
Oil Rem: 211.70 Mbbbl
Oil EUR: 909.99 Mbbbl

Proj Gas Cum: 615.71 MMcf
Gas Rem: 128.86 MMcf
Gas EUR: 744.57 MMcf

Exhibit 11 Historical and Forecast Production Elliott and Ten Eyck - All Wells



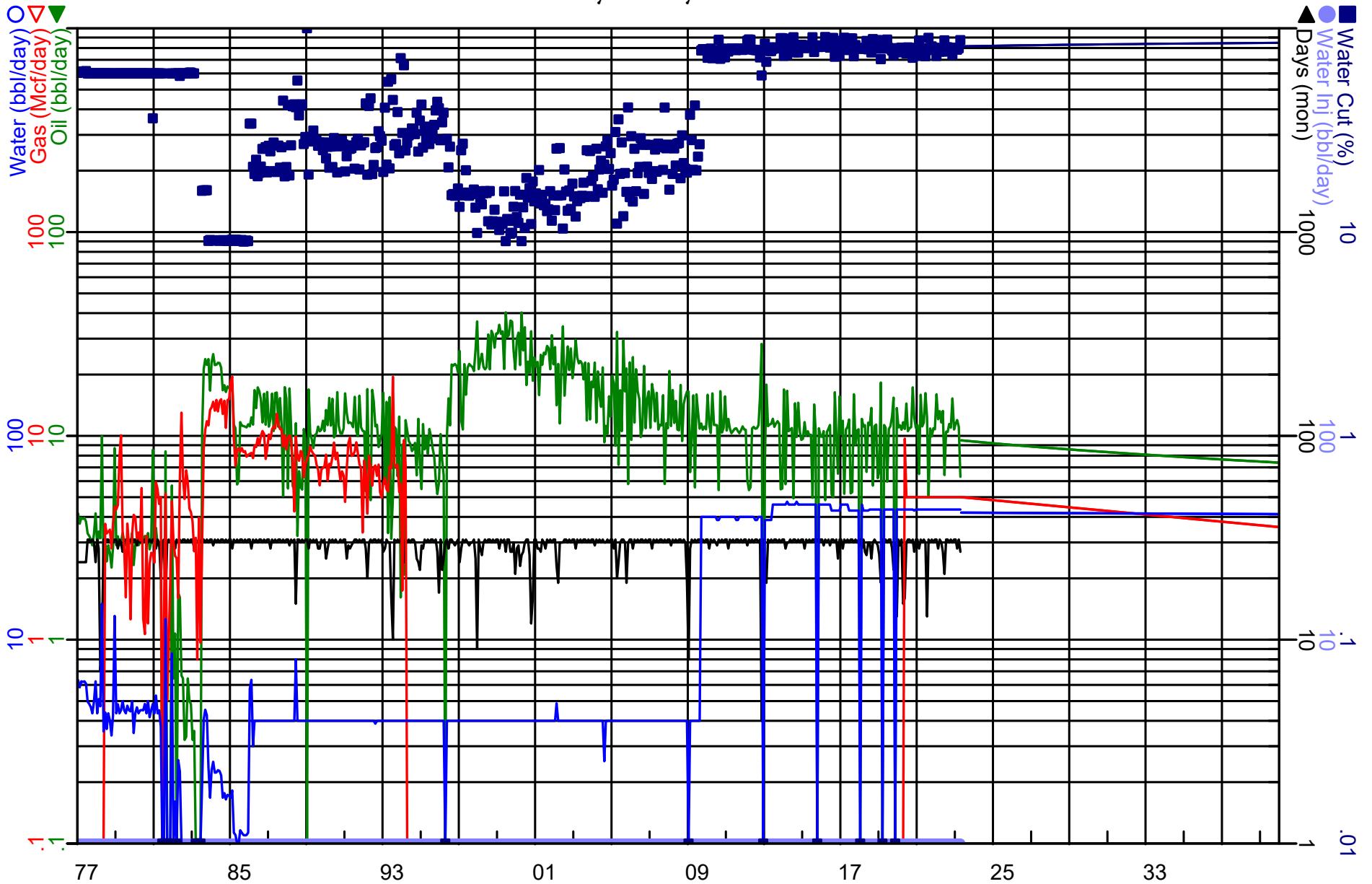
Proj Oil Cum: 4,701.54 Mbbbl
Oil Rem: 684.10 Mbbbl
Oil EUR: 5,385.64 Mbbbl

Proj Gas Cum: 3,776.83 MMcf
Gas Rem: 513.18 MMcf
Gas EUR: 4,290.01 MMcf

Exhibit 12

Historical and Forecast Production

Herley - Kelly LLC Fee 1



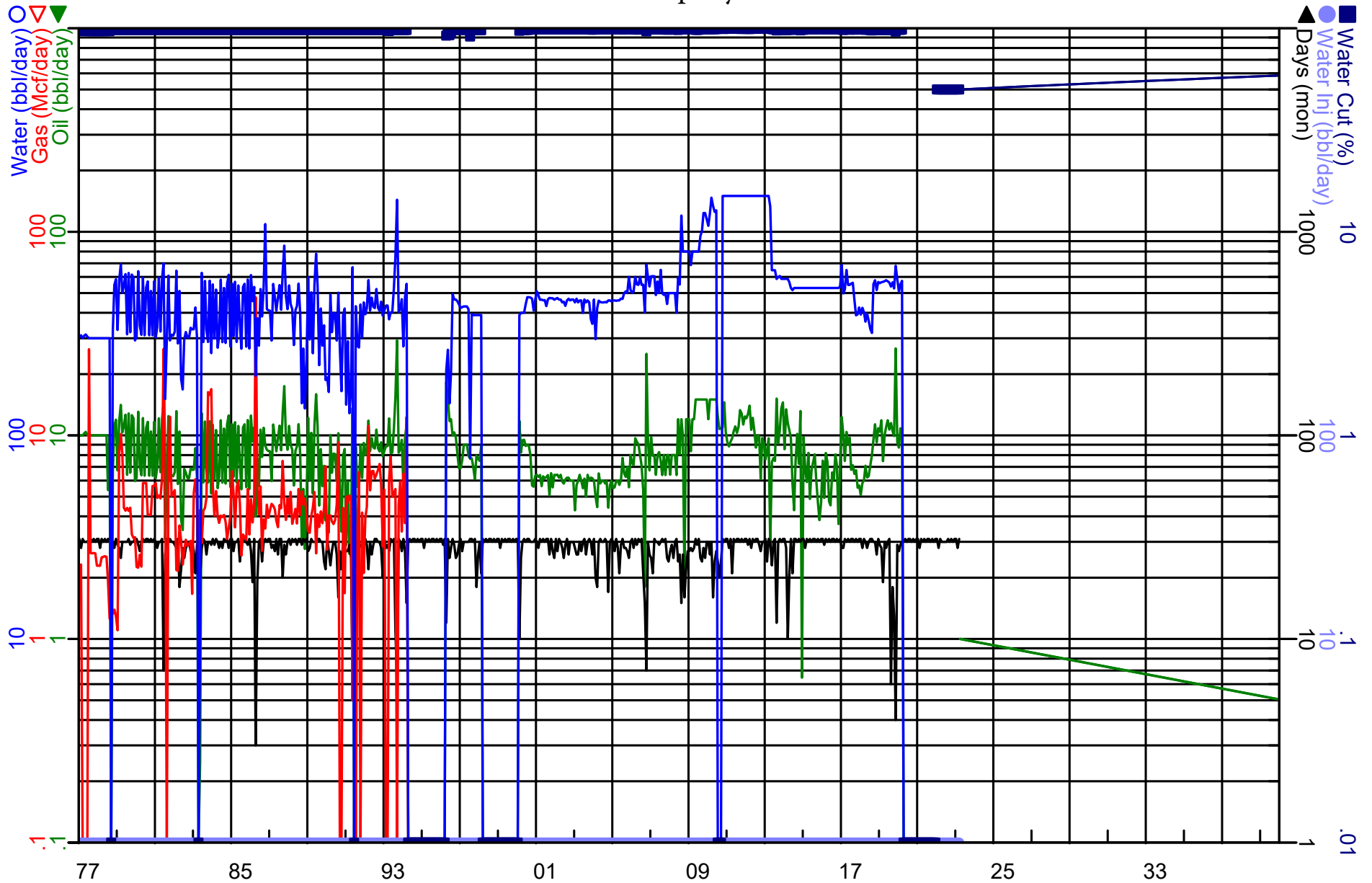
Proj Oil Cum: 204.26 Mbbbl
Oil Rem: 127.07 Mbbbl
Oil EUR: 331.33 Mbbbl

Proj Gas Cum: 46.63 MMcf
Gas Rem: 56.67 MMcf
Gas EUR: 103.30 MMcf

Exhibit 13

Historical and Forecast Production

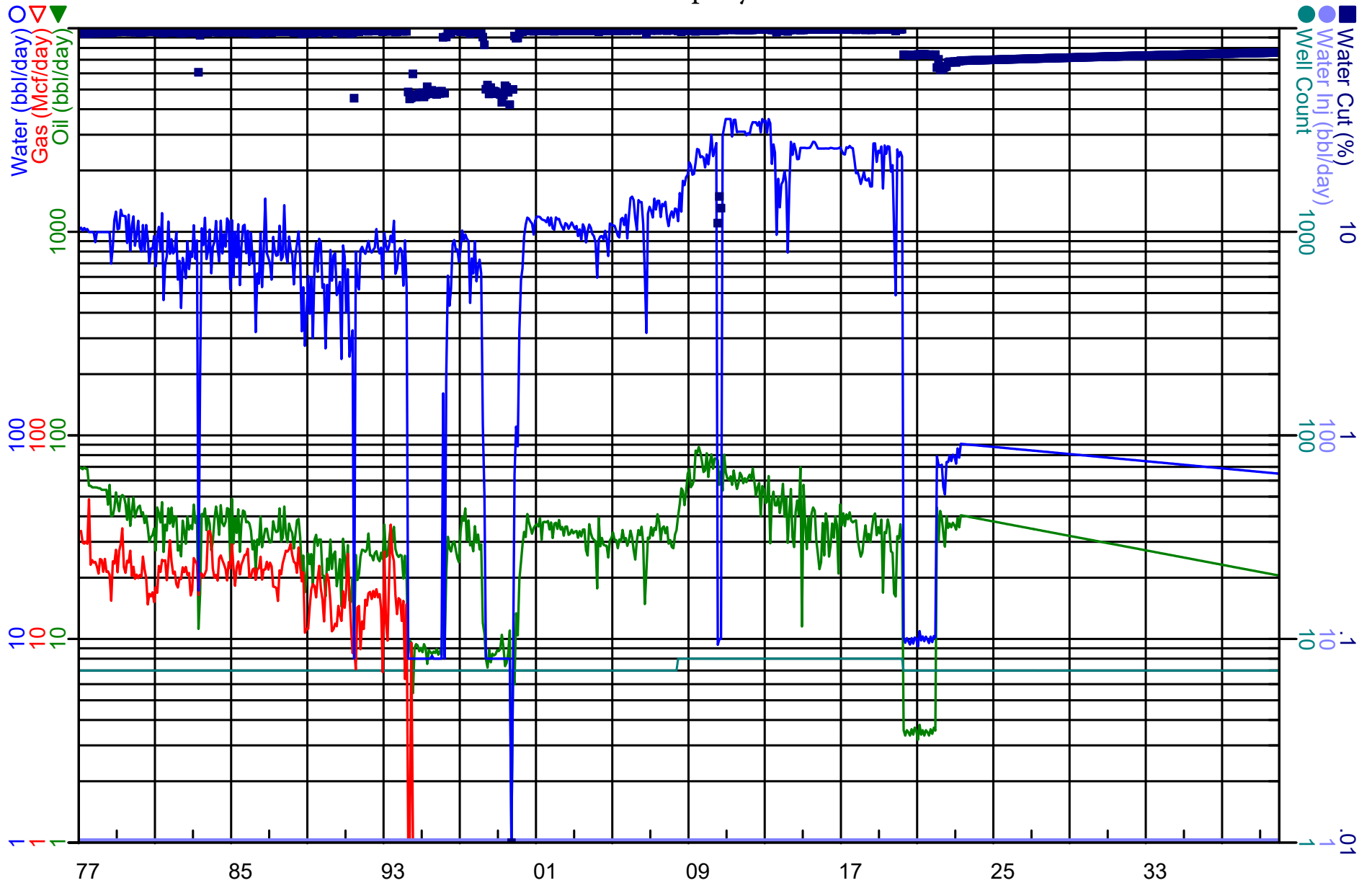
P and M Oil Company - Dutcher 12



Proj Oil Cum: 111.98 Mbbbl
Oil Rem: 7.54 Mbbbl
Oil EUR: 119.52 Mbbbl

Proj Gas Cum: 25.76 MMcf
Gas Rem: 0.00 MMcf
Gas EUR: 25.76 MMcf

Exhibit 14 Historical and Forecast Production P and M Oil Company - All Wells



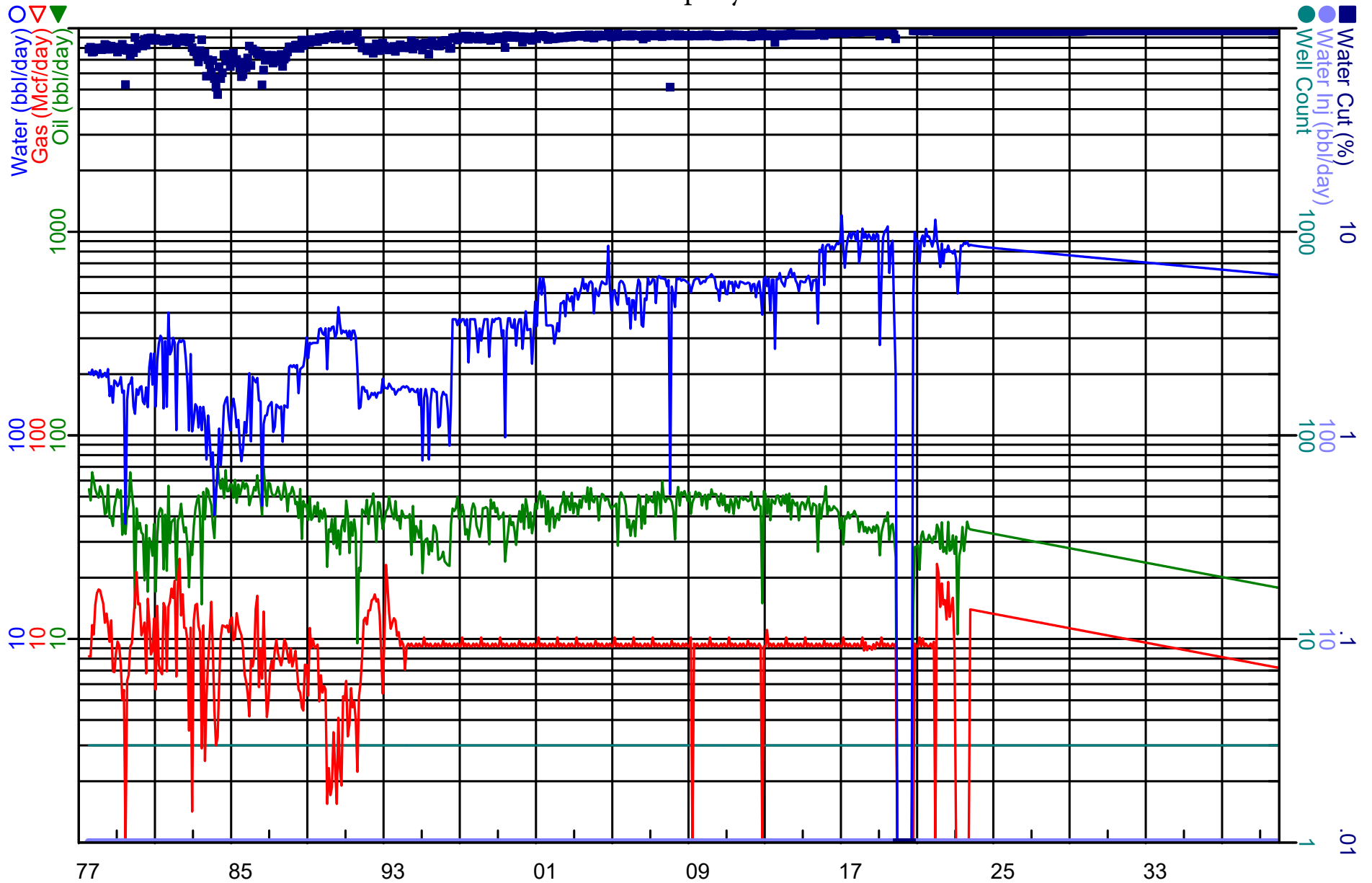
Proj Oil Cum: 585.39 Mbbbl
Oil Rem: 306.31 Mbbbl
Oil EUR: 891.70 Mbbbl

Proj Gas Cum: 130.17 MMcf
Gas Rem: 0.00 MMcf
Gas EUR: 130.17 MMcf

Exhibit 15

Historical and Forecast Production

S and C Oil Company - All Wells



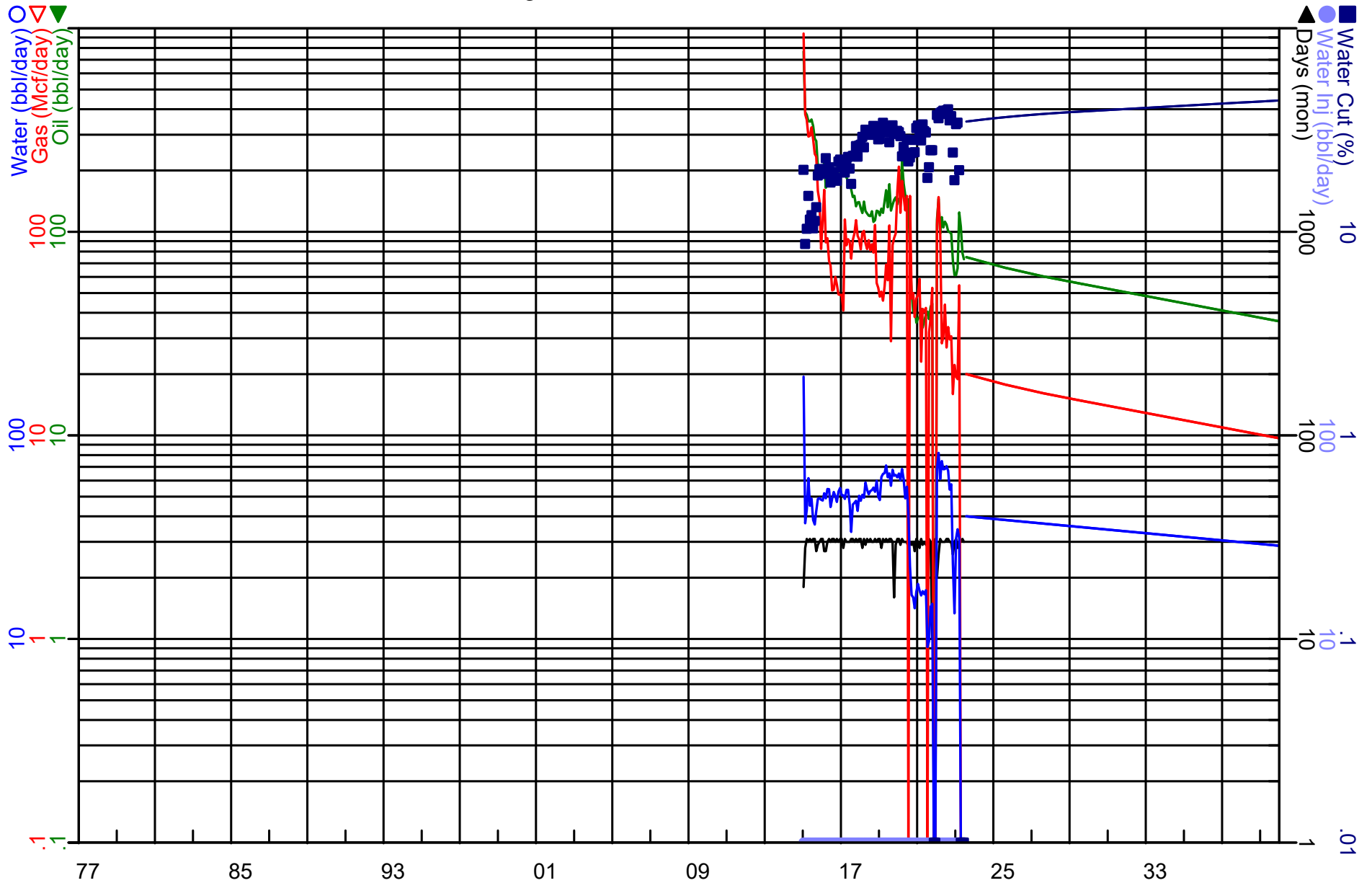
Proj Oil Cum: 697.01 Mbbbl
 Oil Rem: 266.43 Mbbbl
 Oil EUR: 963.45 Mbbbl

Proj Gas Cum: 155.93 MMcf
 Gas Rem: 107.81 MMcf
 Gas EUR: 263.73 MMcf

Exhibit 16

Historical and Forecast Production

Signal Hill Petroleum - B302



Proj Oil Cum: 454.16 Mbbbl
Oil Rem: 544.72 Mbbbl
Oil EUR: 998.88 Mbbbl

Proj Gas Cum: 286.21 MMcf
Gas Rem: 145.26 MMcf
Gas EUR: 431.47 MMcf

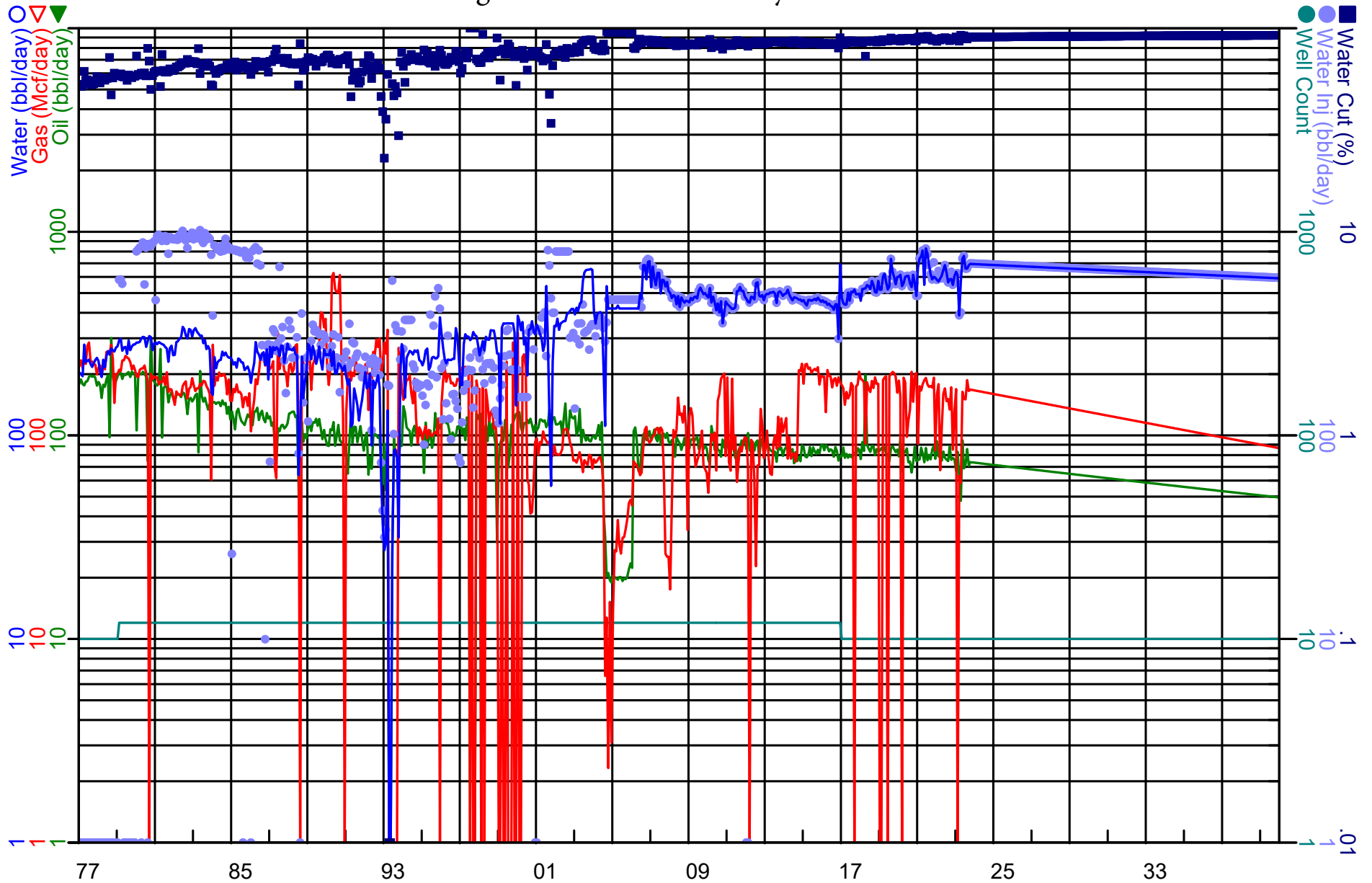
Signal Hill Petroleum
Bryant
All

Exhibit 17

Historical and Forecast Production

Signal Hill Petroleum - Bryant Lease

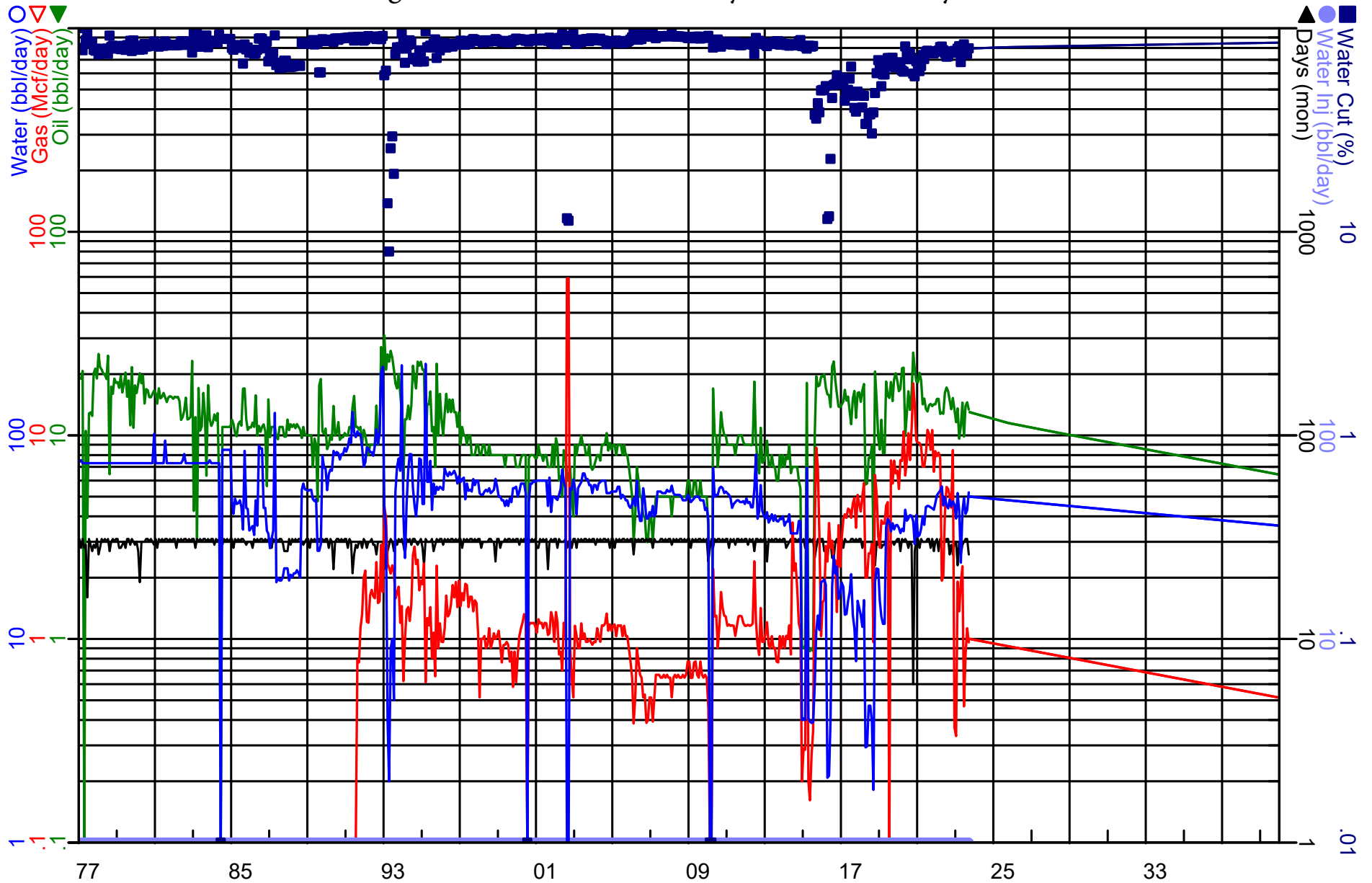
Field: Seal Beach
Los Angeles County, California
Proved Producing



Proj Oil Cum: 1,804.66 Mbbbl
Oil Rem: 783.69 Mbbbl
Oil EUR: 2,588.35 Mbbbl

Proj Gas Cum: 2,569.23 MMcf
Gas Rem: 1,295.21 MMcf
Gas EUR: 3,864.43 MMcf

Historical and Forecast Production
Signal Hill Petroleum - Cherry Hill Community 10



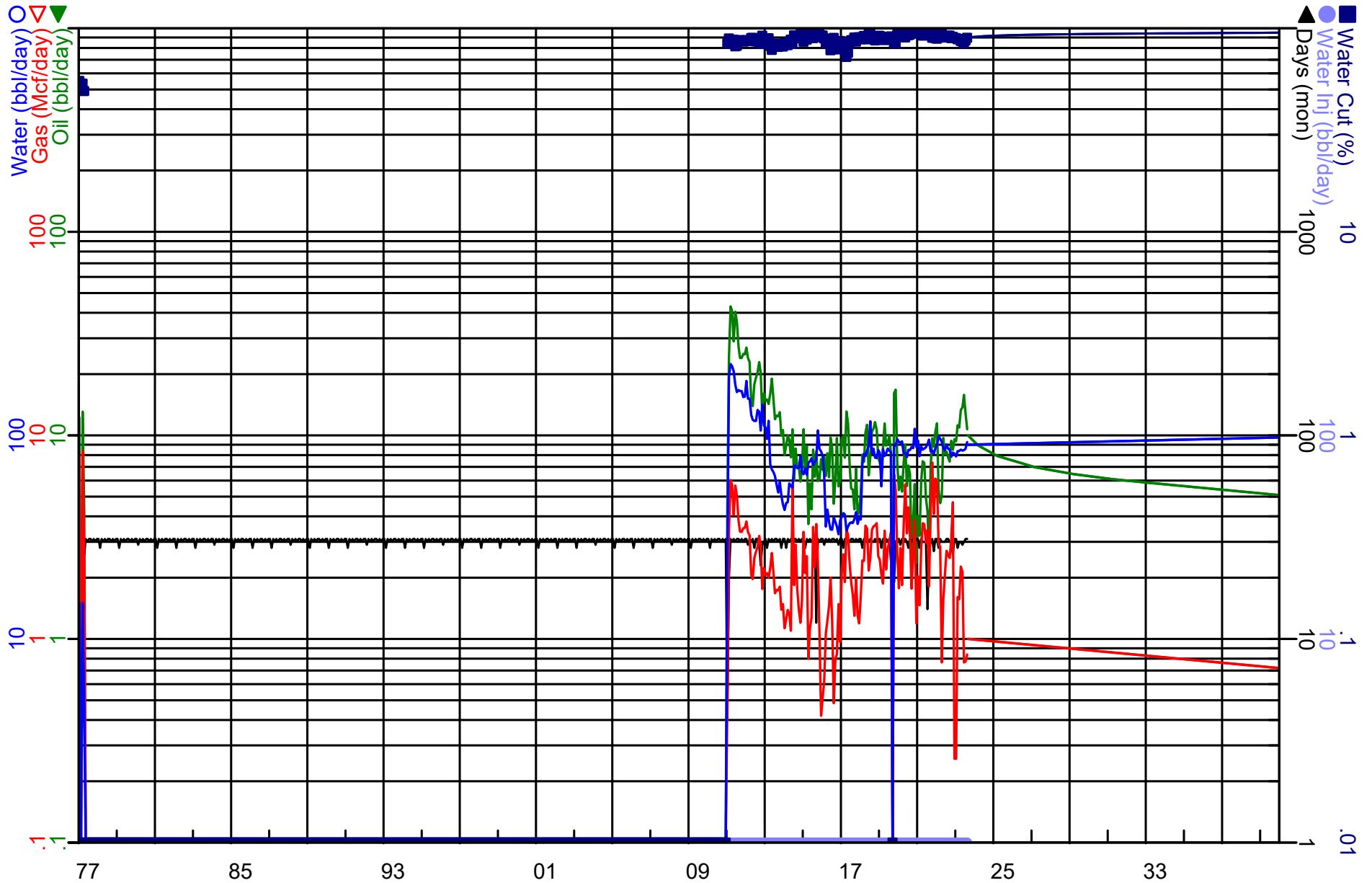
Proj Oil Cum: 188.94 Mbbbl
Oil Rem: 96.05 Mbbbl
Oil EUR: 284.98 Mbbbl

Proj Gas Cum: 27.57 MMcf
Gas Rem: 7.70 MMcf
Gas EUR: 35.27 MMcf

Exhibit 19

Historical and Forecast Production

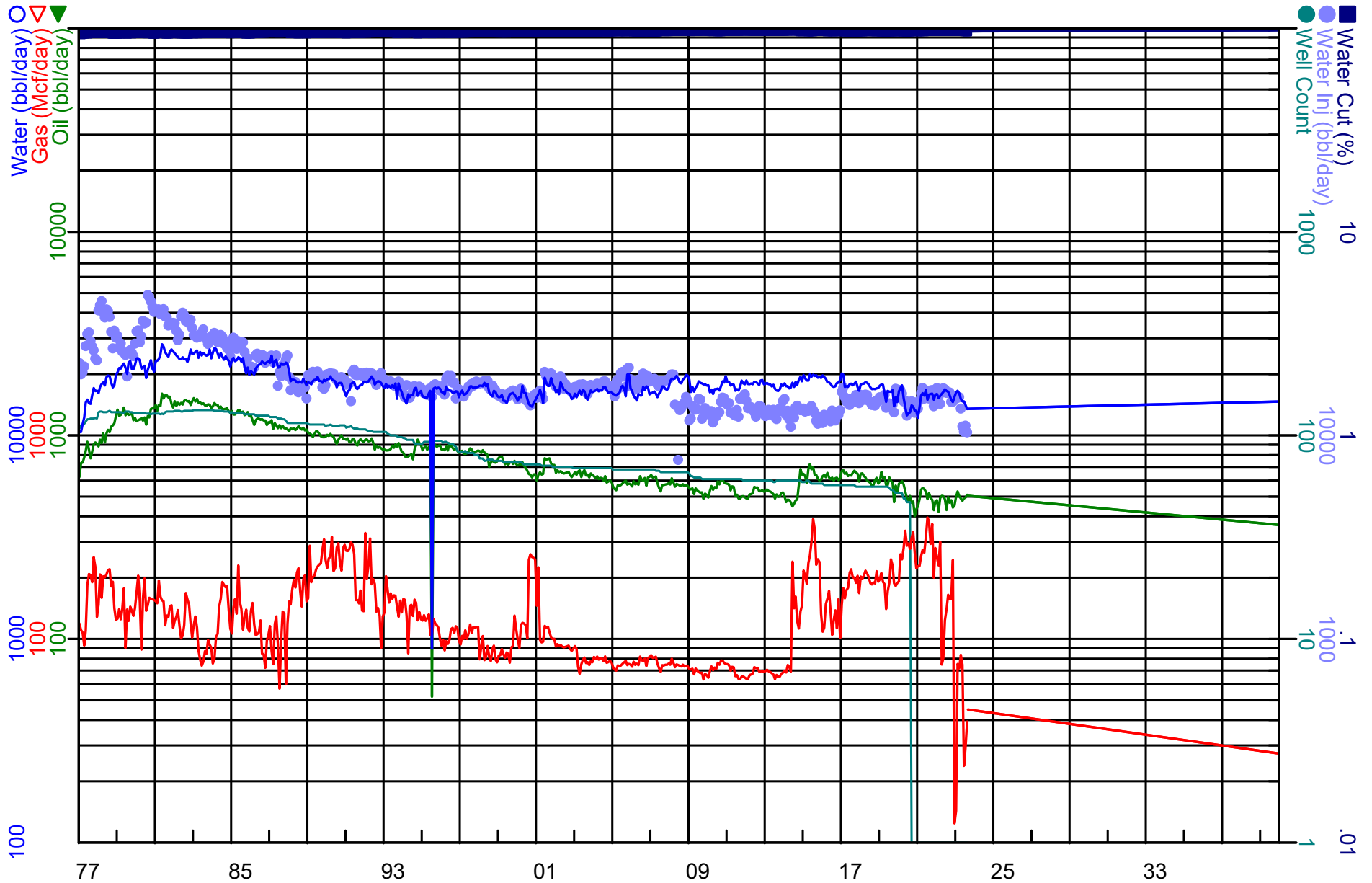
Signal Hill Petroleum - Long Beach Airport C 37



Proj Oil Cum: 50.86 Mbbbl
 Oil Rem: 82.16 Mbbbl
 Oil EUR: 133.01 Mbbbl

Proj Gas Cum: 11.83 MMcf
 Gas Rem: 11.41 MMcf
 Gas EUR: 23.24 MMcf

Historical and Forecast Production
 Signal Hill Petroleum - Signal Hill East Unit (All Wells)

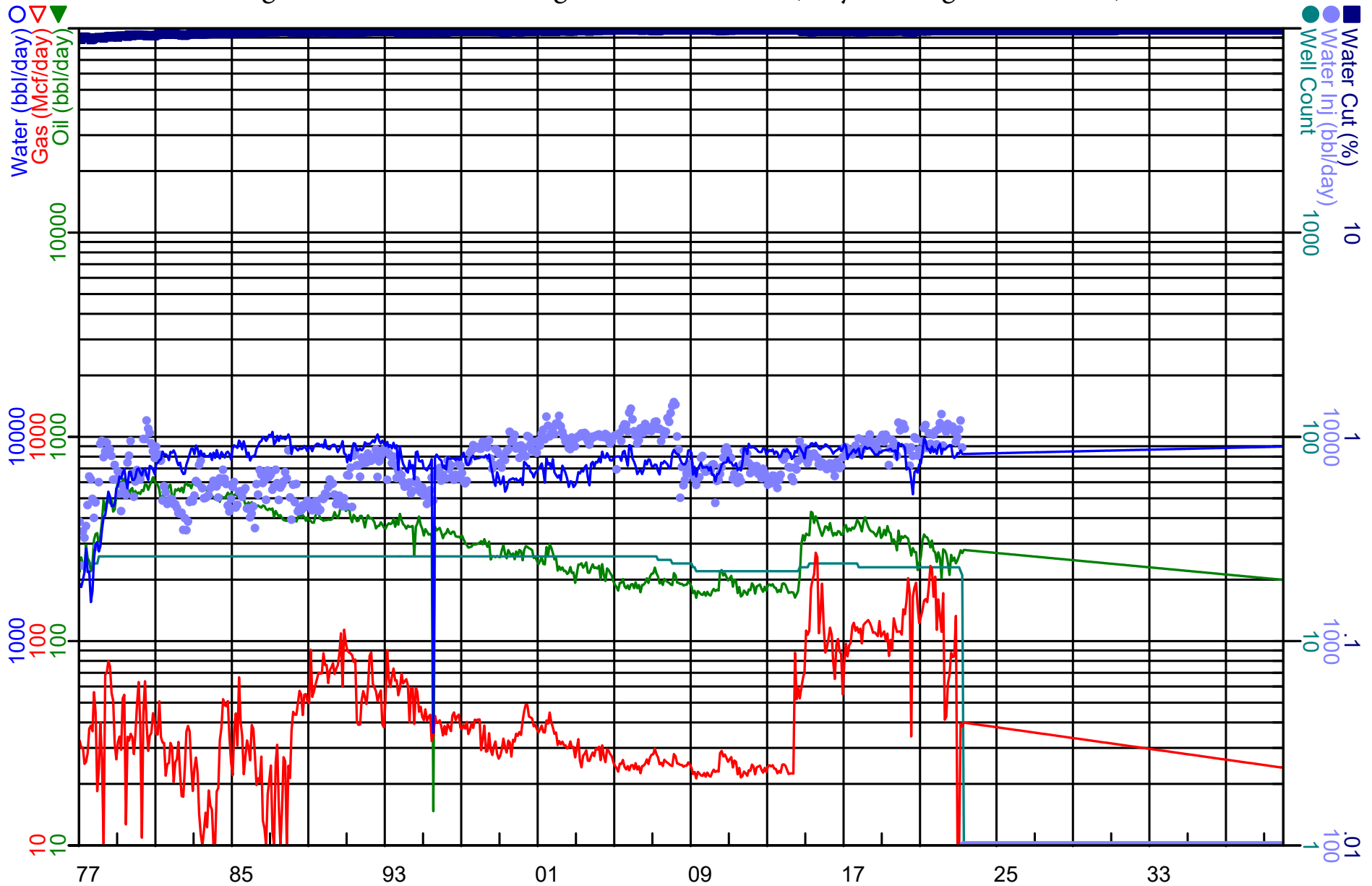


Proj Oil Cum: 13,947.90 Mbbbl
 Oil Rem: 4,654.42 Mbbbl
 Oil EUR: 18,602.32 Mbbbl

Proj Gas Cum: 2,335.10 MMcf
 Gas Rem: 353.71 MMcf
 Gas EUR: 2,688.80 MMcf

Historical and Forecast Production

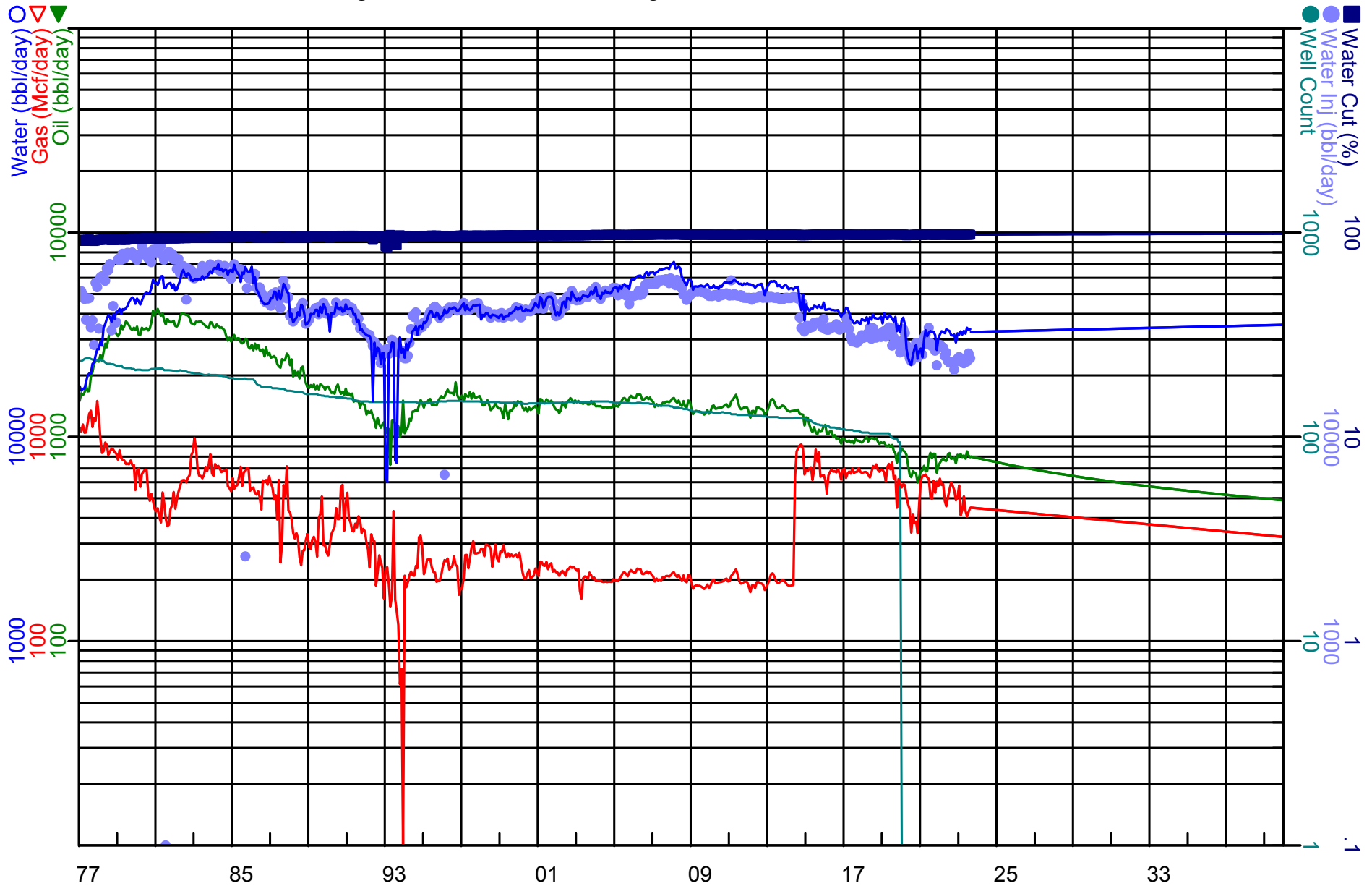
Signal Hill Petroleum - Signal Hill East Unit (City of Long Beach Wells)



Proj Oil Cum: 5,697.42 Mbbbl
 Oil Rem: 3,167.99 Mbbbl
 Oil EUR: 8,865.41 Mbbbl

Proj Gas Cum: 880.89 MMcf
 Gas Rem: 366.31 MMcf
 Gas EUR: 1,247.20 MMcf

Historical and Forecast Production
 Signal Hill Petroleum - Signal Hill West Unit (All Wells)

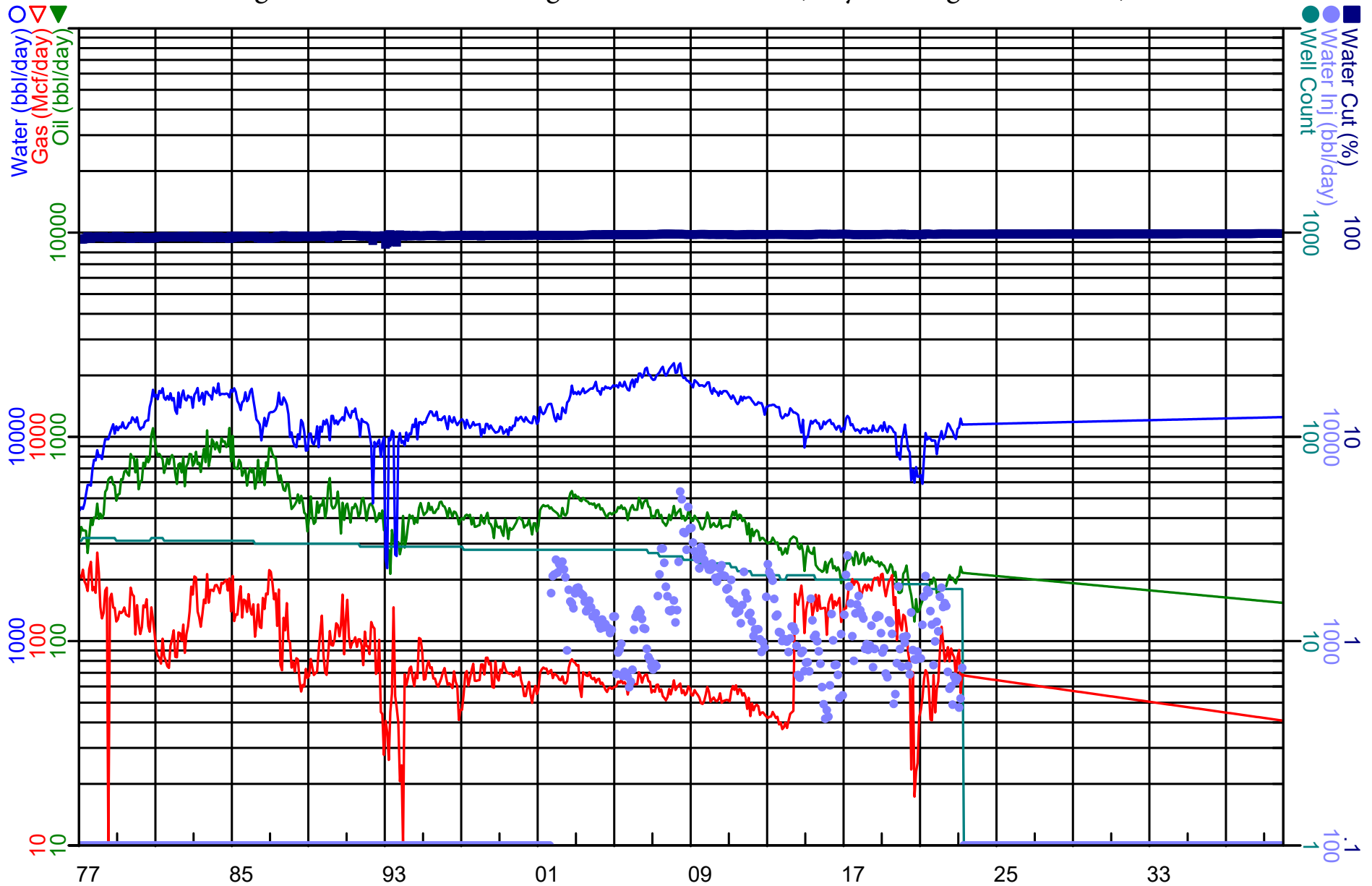


Proj Oil Cum: 29,834.24 Mbbbl
 Oil Rem: 8,343.86 Mbbbl
 Oil EUR: 38,178.10 Mbbbl

Proj Gas Cum: 7,211.87 MMcf
 Gas Rem: 5,134.68 MMcf
 Gas EUR: 12,346.55 MMcf

Historical and Forecast Production

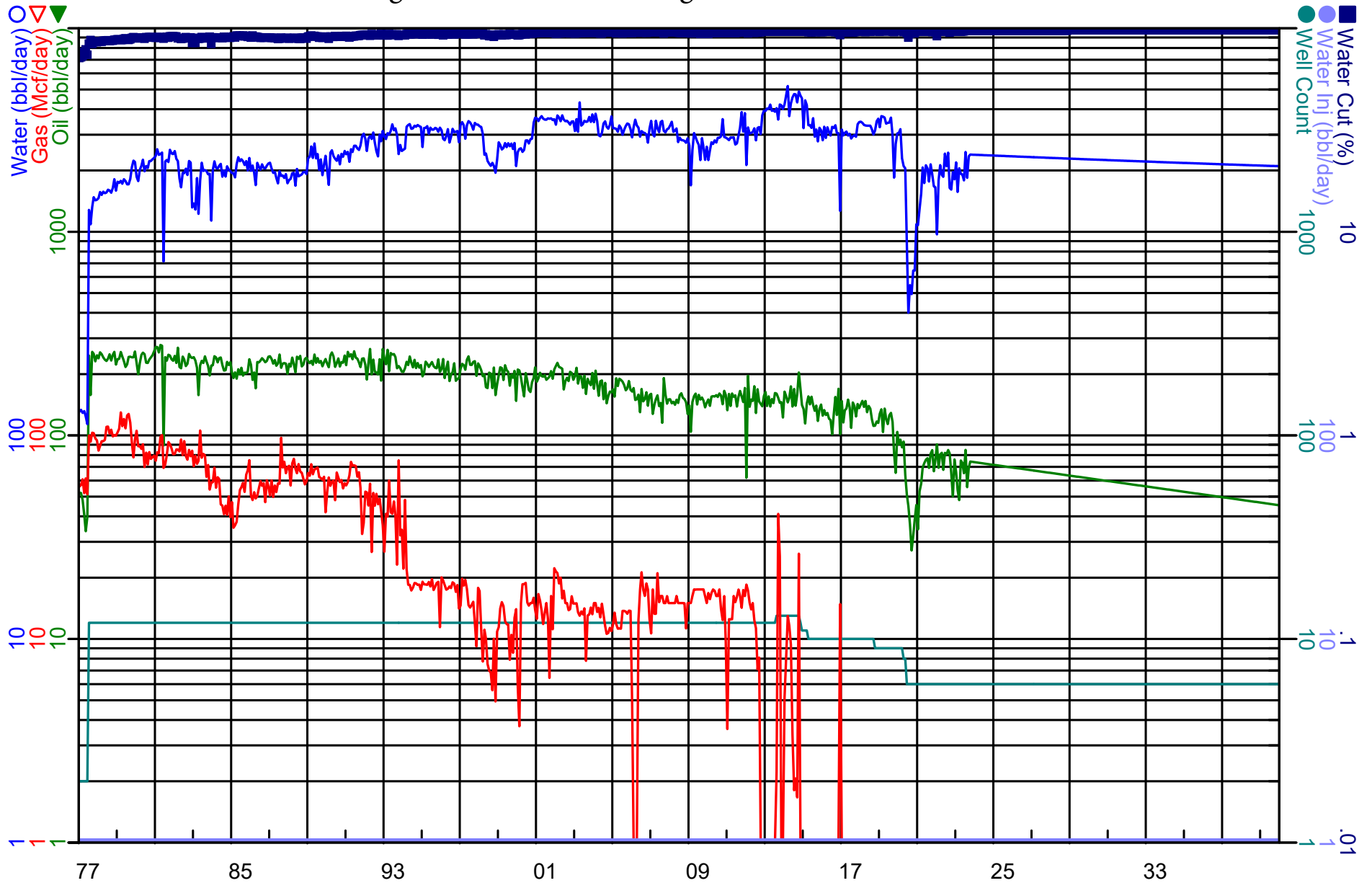
Signal Hill Petroleum - Signal Hill West Unit (City of Long Beach Wells)



Proj Oil Cum: 7,490.34 Mbbbl
 Oil Rem: 2,443.88 Mbbbl
 Oil EUR: 9,934.22 Mbbbl

Proj Gas Cum: 1,671.99 MMcf
 Gas Rem: 622.73 MMcf
 Gas EUR: 2,294.72 MMcf

Historical and Forecast Production Signal Hill Petroleum - Signal Hill Non Unit Wells



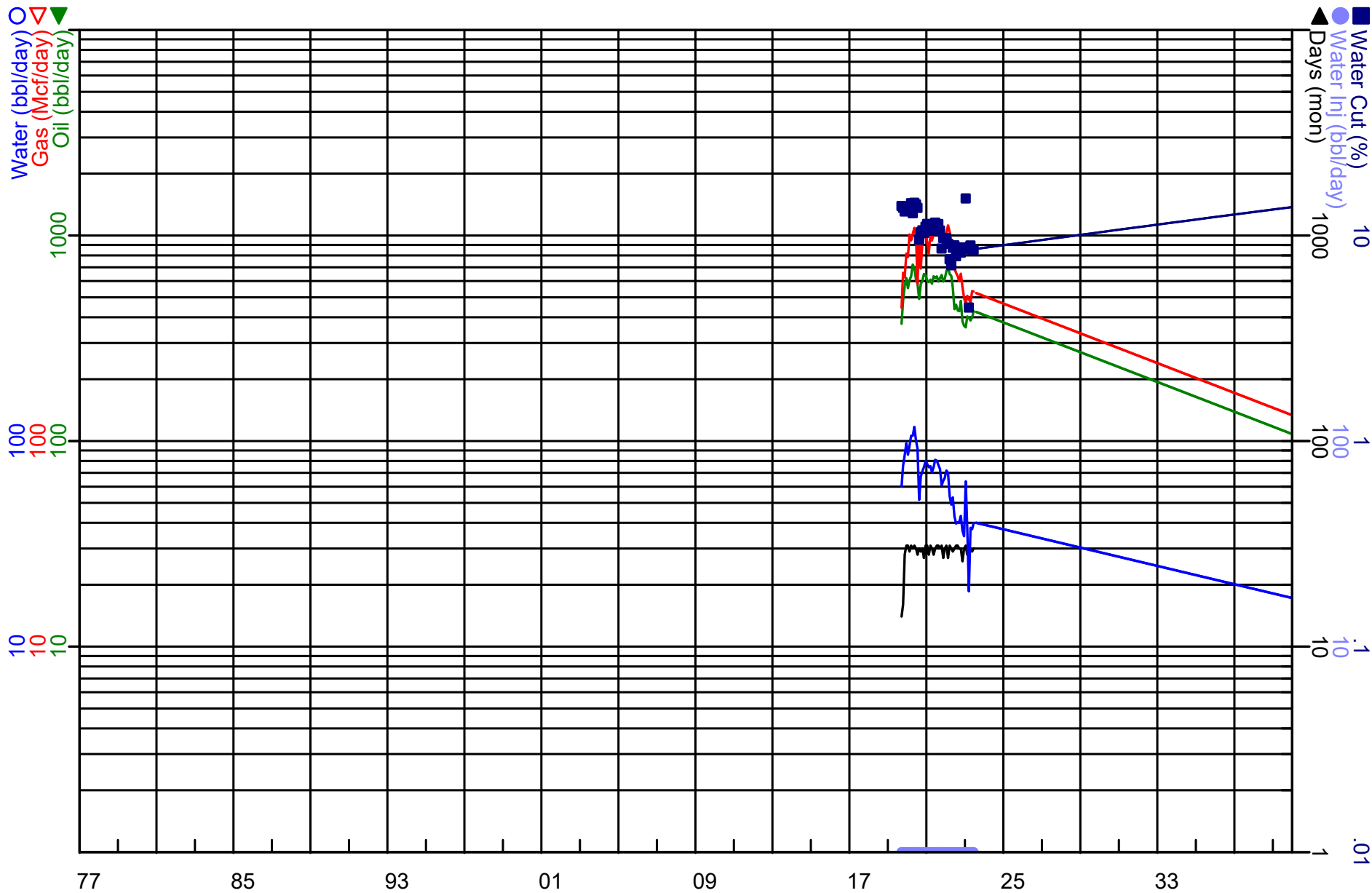
Proj Oil Cum: 3,090.70 Mbbbl
Oil Rem: 692.75 Mbbbl
Oil EUR: 3,783.45 Mbbbl

Proj Gas Cum: 532.56 MMcf
Gas Rem: 0.00 MMcf
Gas EUR: 532.56 MMcf

Exhibit 25

Historical and Forecast Production

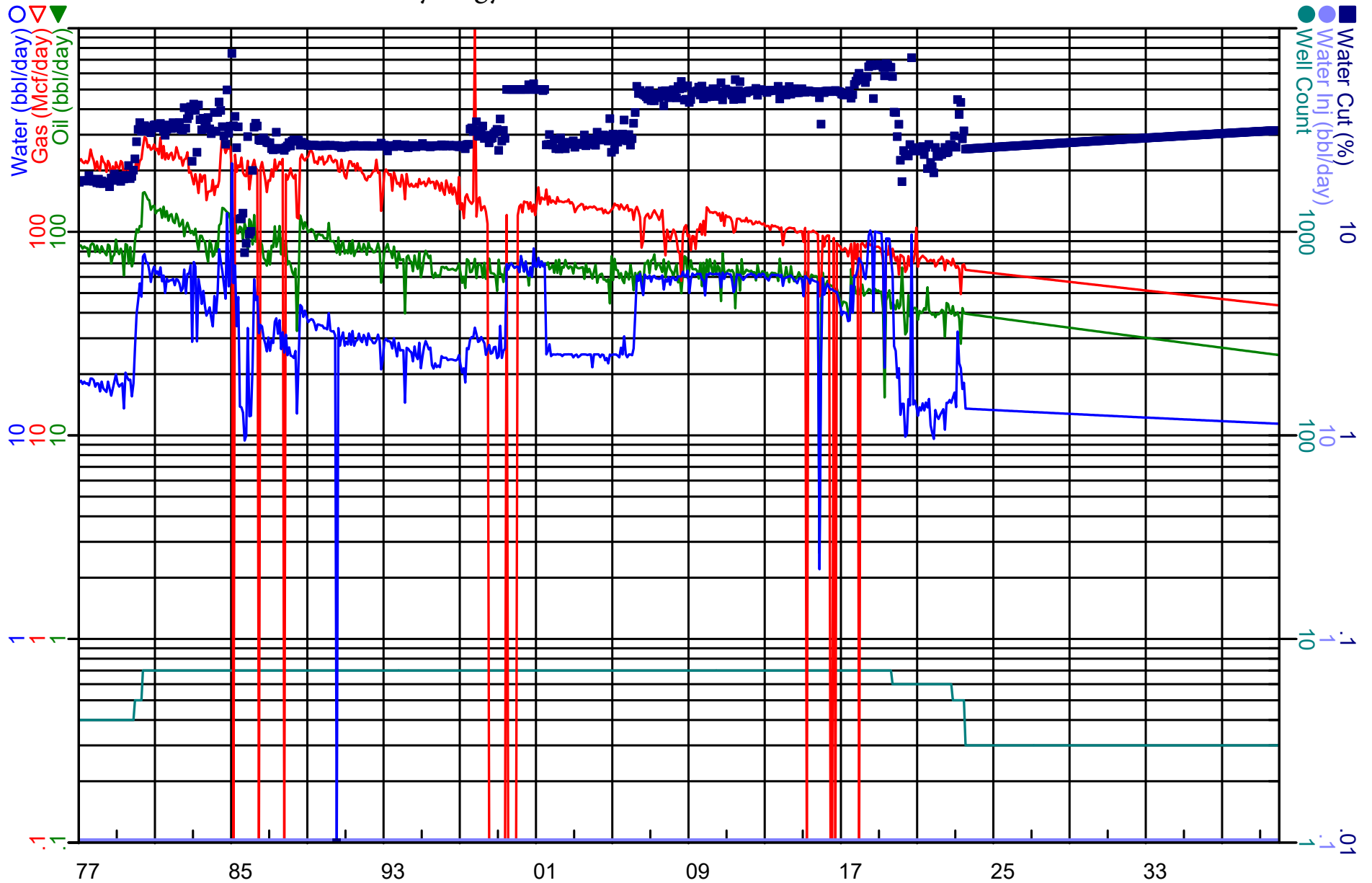
Signal Hill Petroleum - TC 1



Proj Oil Cum: 804.79 Mbbbl
Oil Rem: 1,768.78 Mbbbl
Oil EUR: 2,573.57 Mbbbl

Proj Gas Cum: 1,183.36 MMcf
Gas Rem: 2,184.96 MMcf
Gas EUR: 3,368.33 MMcf

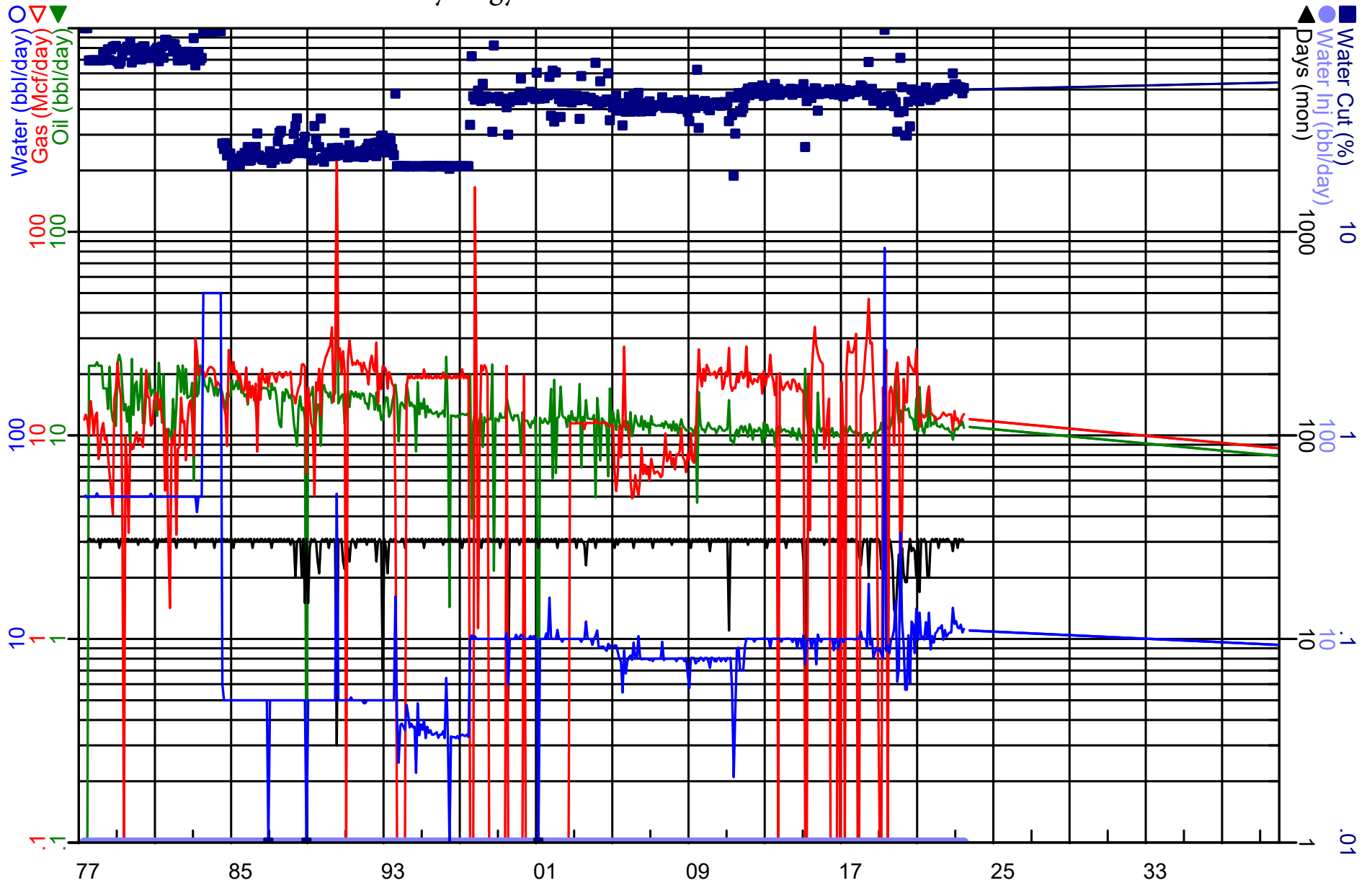
Historical and Forecast Production Synergy Oil and Gas - Recreation Park Lease



Proj Oil Cum: 1,225.26 Mbbbl
Oil Rem: 385.63 Mbbbl
Oil EUR: 1,610.89 Mbbbl

Proj Gas Cum: 2,483.19 MMcf
Gas Rem: 683.65 MMcf
Gas EUR: 3,166.84 MMcf

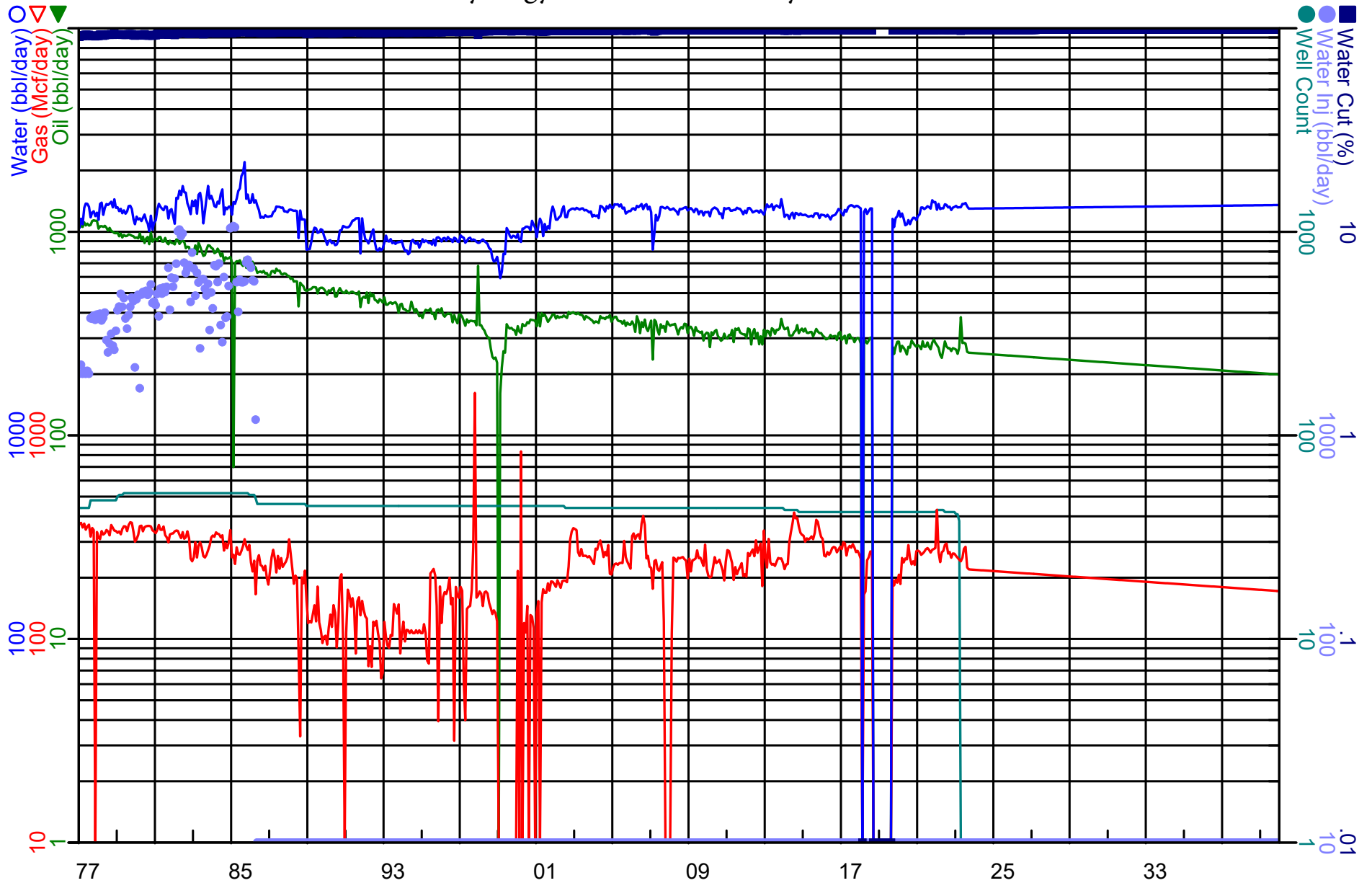
Historical and Forecast Production Synergy Oil and Gas - Recreation Park E 1



Proj Oil Cum: 213.62 Mbbbl
Oil Rem: 125.72 Mbbbl
Oil EUR: 339.34 Mbbbl

Proj Gas Cum: 232.62 MMcf
Gas Rem: 137.15 MMcf
Gas EUR: 369.77 MMcf

Exhibit 28 Historical and Forecast Production Synergy Oil and Gas - Bixby A Lease



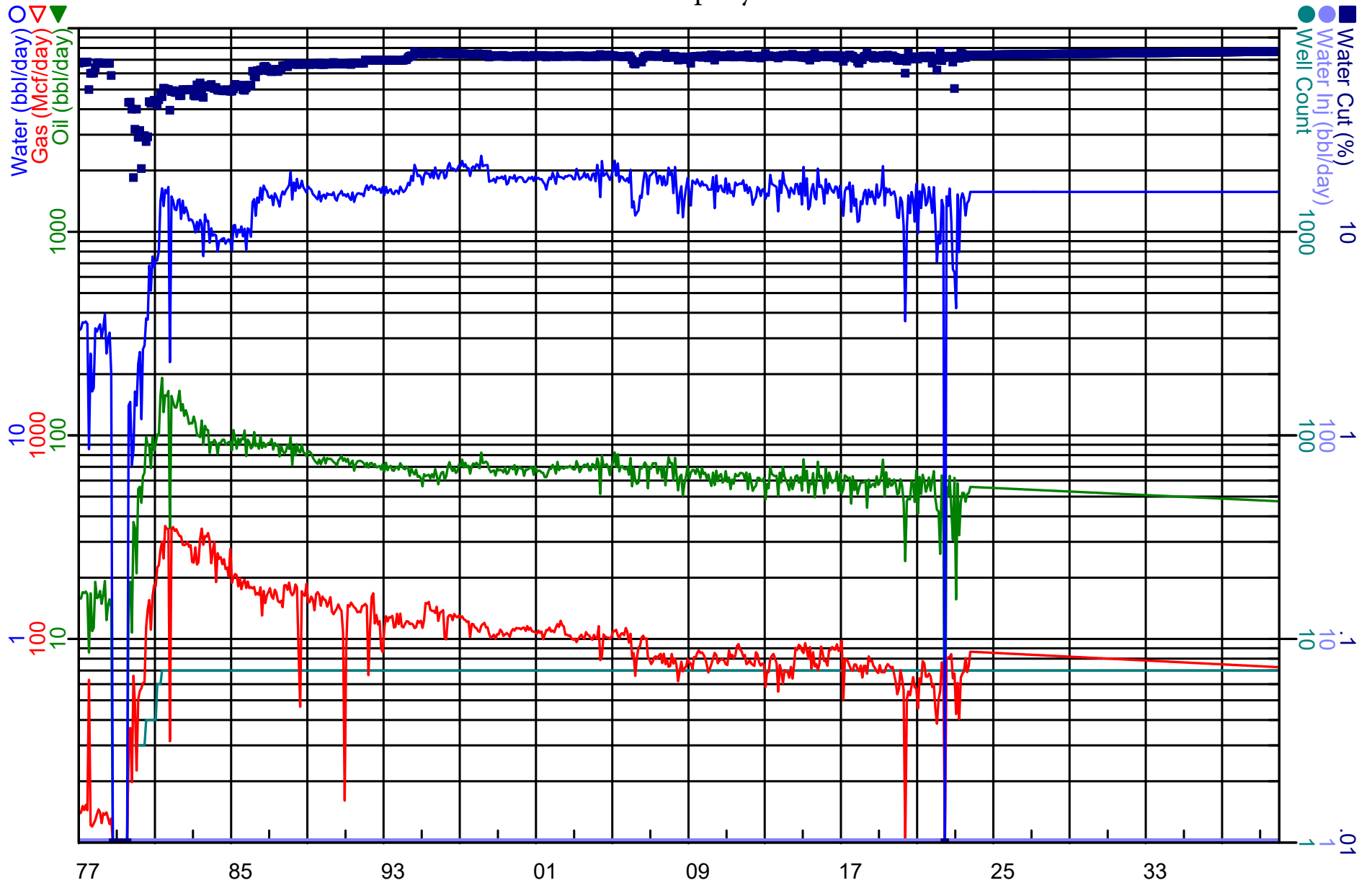
Proj Oil Cum: 7,999.53 Mbbbl
Oil Rem: 3,249.45 Mbbbl
Oil EUR: 11,248.98 Mbbbl

Proj Gas Cum: 3,864.12 MMcf
Gas Rem: 2,803.44 MMcf
Gas EUR: 6,667.57 MMcf

Exhibit 29

Historical and Forecast Production

The Lansdale Company - All Wells



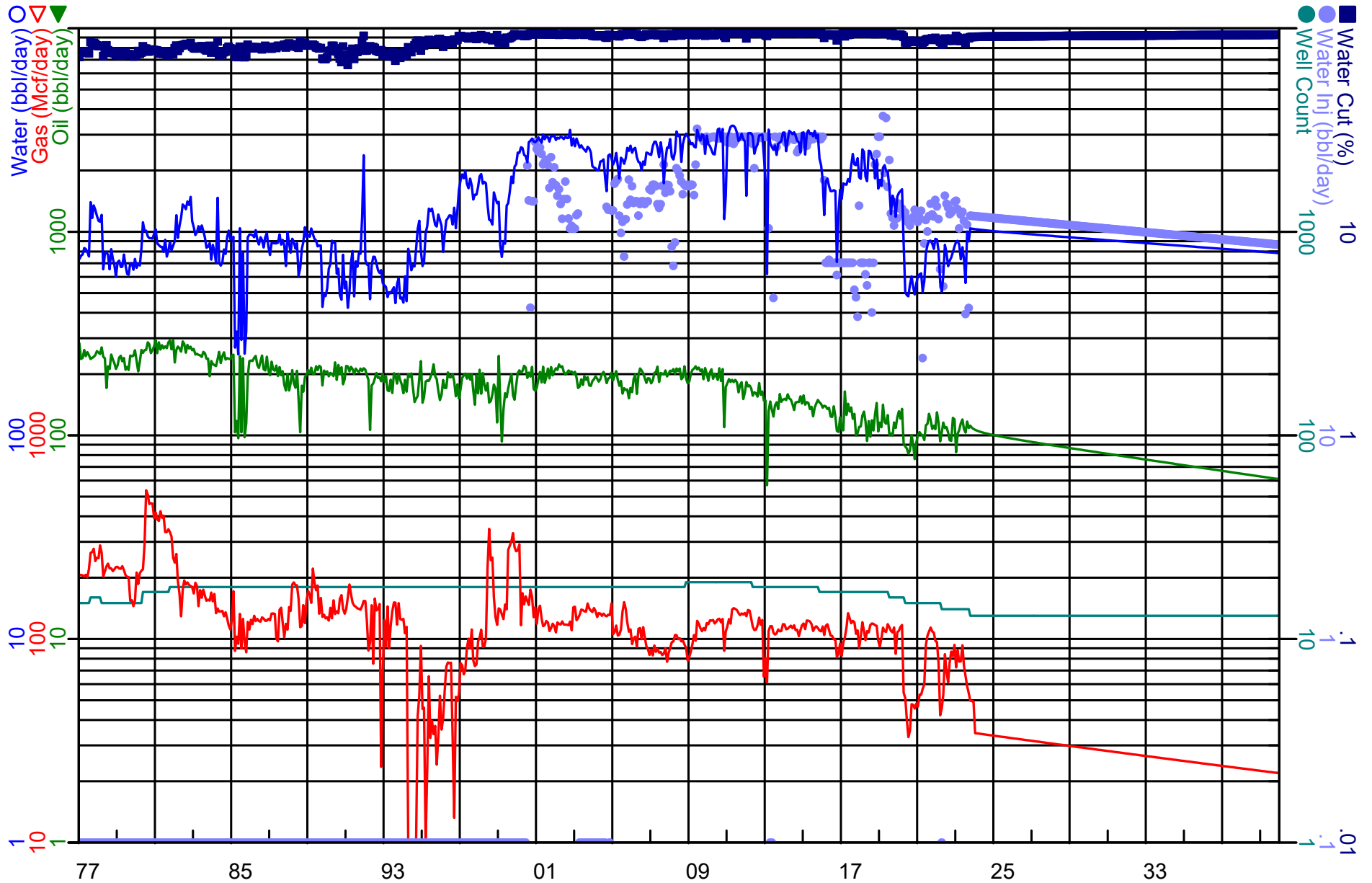
Proj Oil Cum: 1,158.71 Mbbbl
Oil Rem: 799.88 Mbbbl
Oil EUR: 1,958.59 Mbbbl

Proj Gas Cum: 1,933.23 MMcf
Gas Rem: 1,218.89 MMcf
Gas EUR: 3,152.13 MMcf

Exhibit 30

Historical and Forecast Production

The Termo Company - All Wells

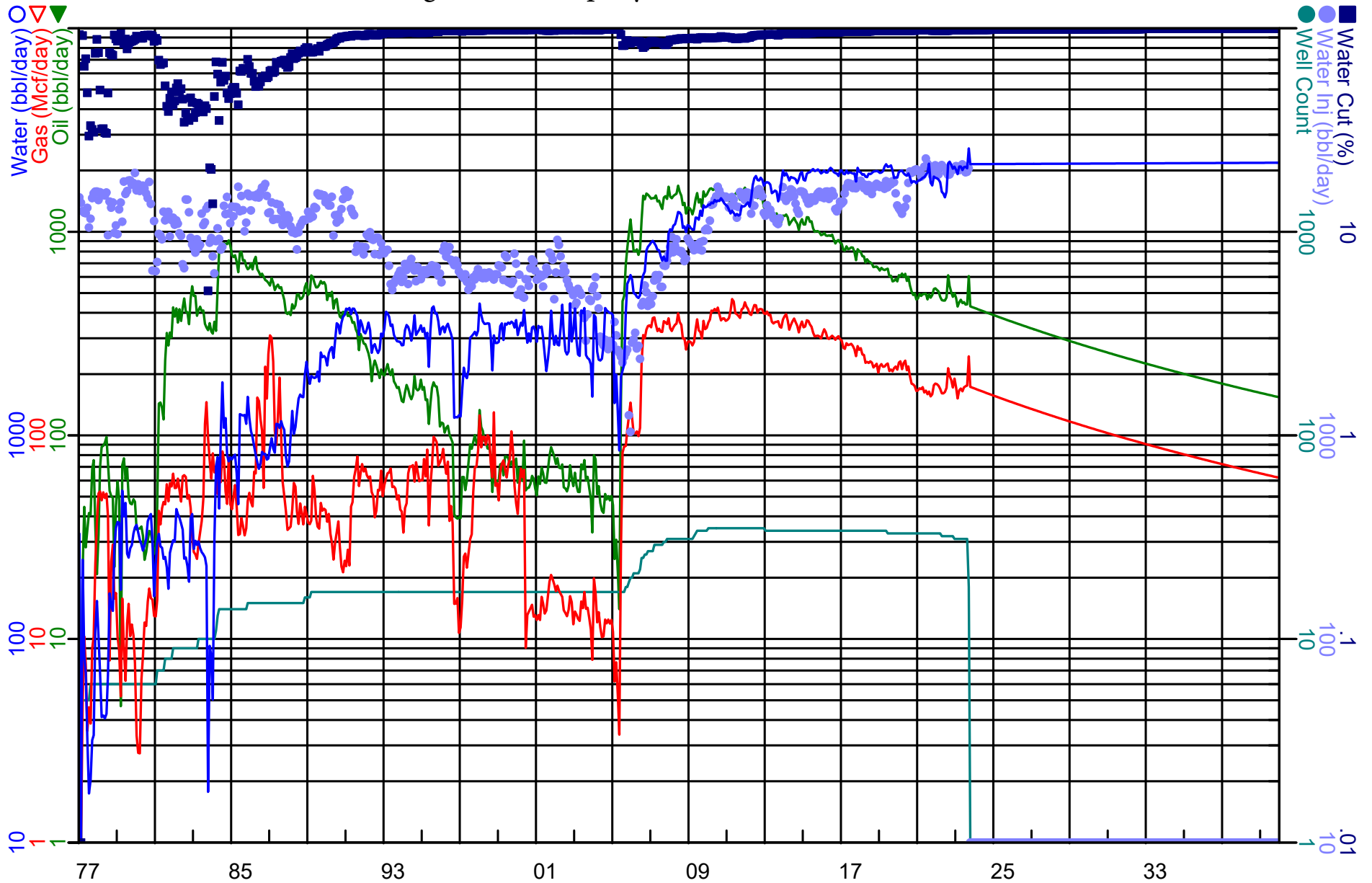


Proj Oil Cum: 3,152.07 Mbbbl
 Oil Rem: 942.92 Mbbbl
 Oil EUR: 4,094.99 Mbbbl

Proj Gas Cum: 2,286.07 MMcf
 Gas Rem: 342.88 MMcf
 Gas EUR: 2,628.95 MMcf

Historical and Forecast Production

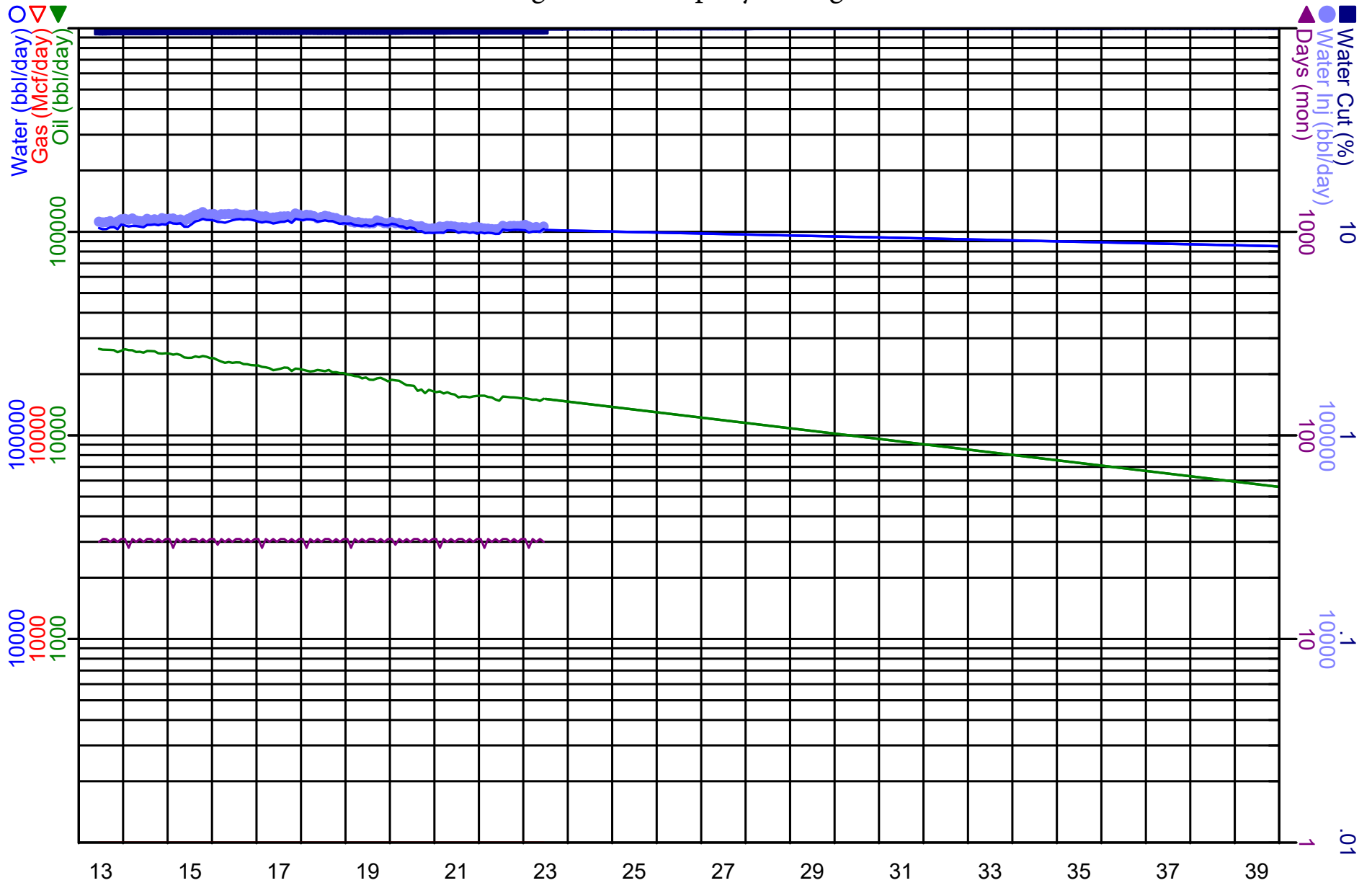
THUMS Long Beach Company - State PRC 186 (Belmont Offshore)



Proj Oil Cum: 9,450.59 Mbbbl
Oil Rem: 2,492.32 Mbbbl
Oil EUR: 11,942.91 Mbbbl

Proj Gas Cum: 2,418.23 MMcf
Gas Rem: 1,002.66 MMcf
Gas EUR: 3,420.88 MMcf

Historical and Forecast Production THUMS Long Beach Company - Long Beach Unit



Proj Oil Cum: 77,829.15 Mbbbl
Oil Rem: 84,341.54 Mbbbl
Oil EUR: 162,170.69 Mbbbl

Proj Gas Cum: 0.00 MMcf
Gas Rem: 0.00 MMcf
Gas EUR: 0.00 MMcf

THUMS Long Beach Company
 Lease
 ALL

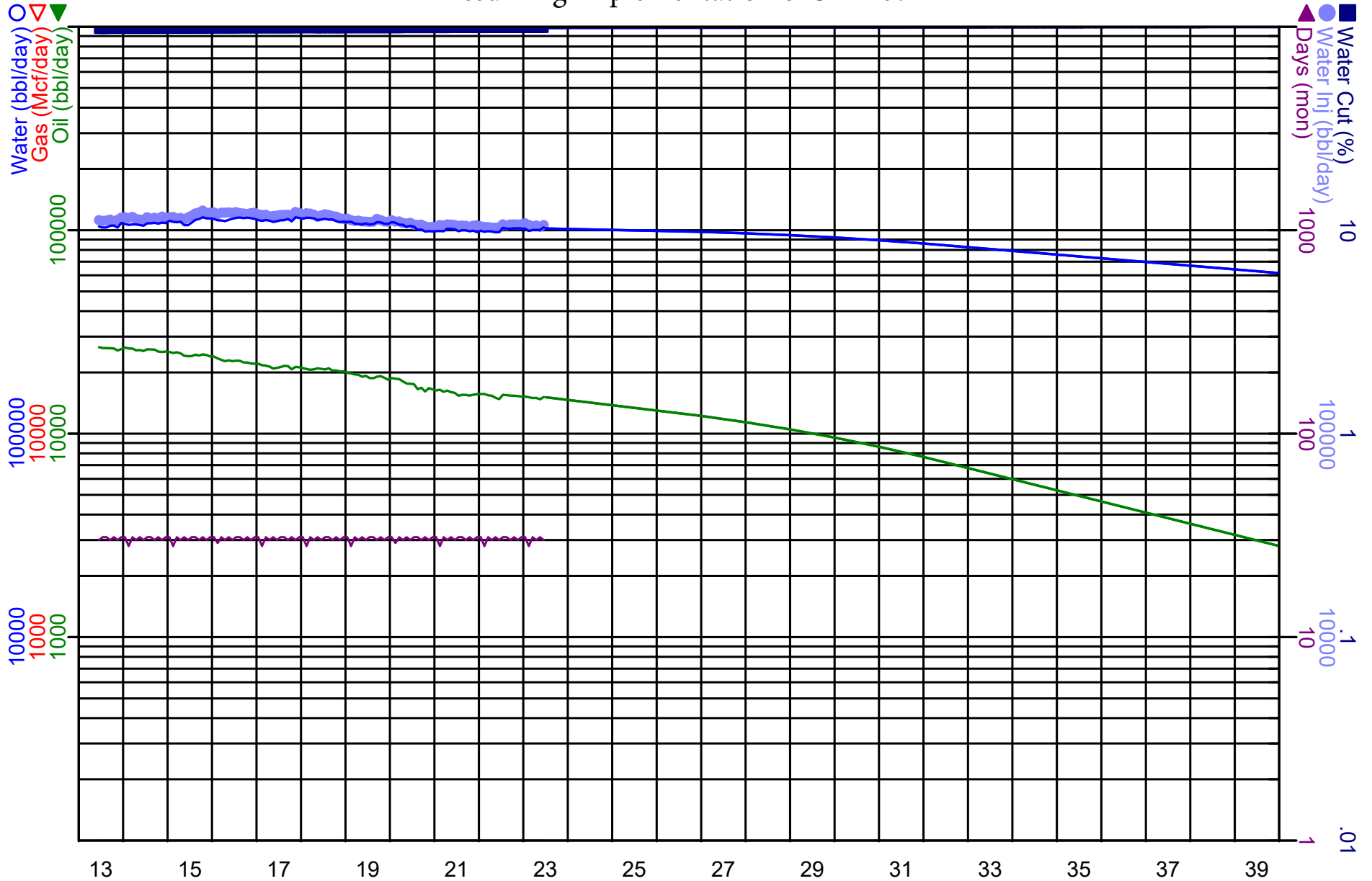
Exhibit 32B

Historical and Forecast Production

THUMS Long Beach Company - Long Beach Unit

Assuming Implementation of SB 1137

Field: Wilmington
 Los Angeles County, California
 Proved Producing



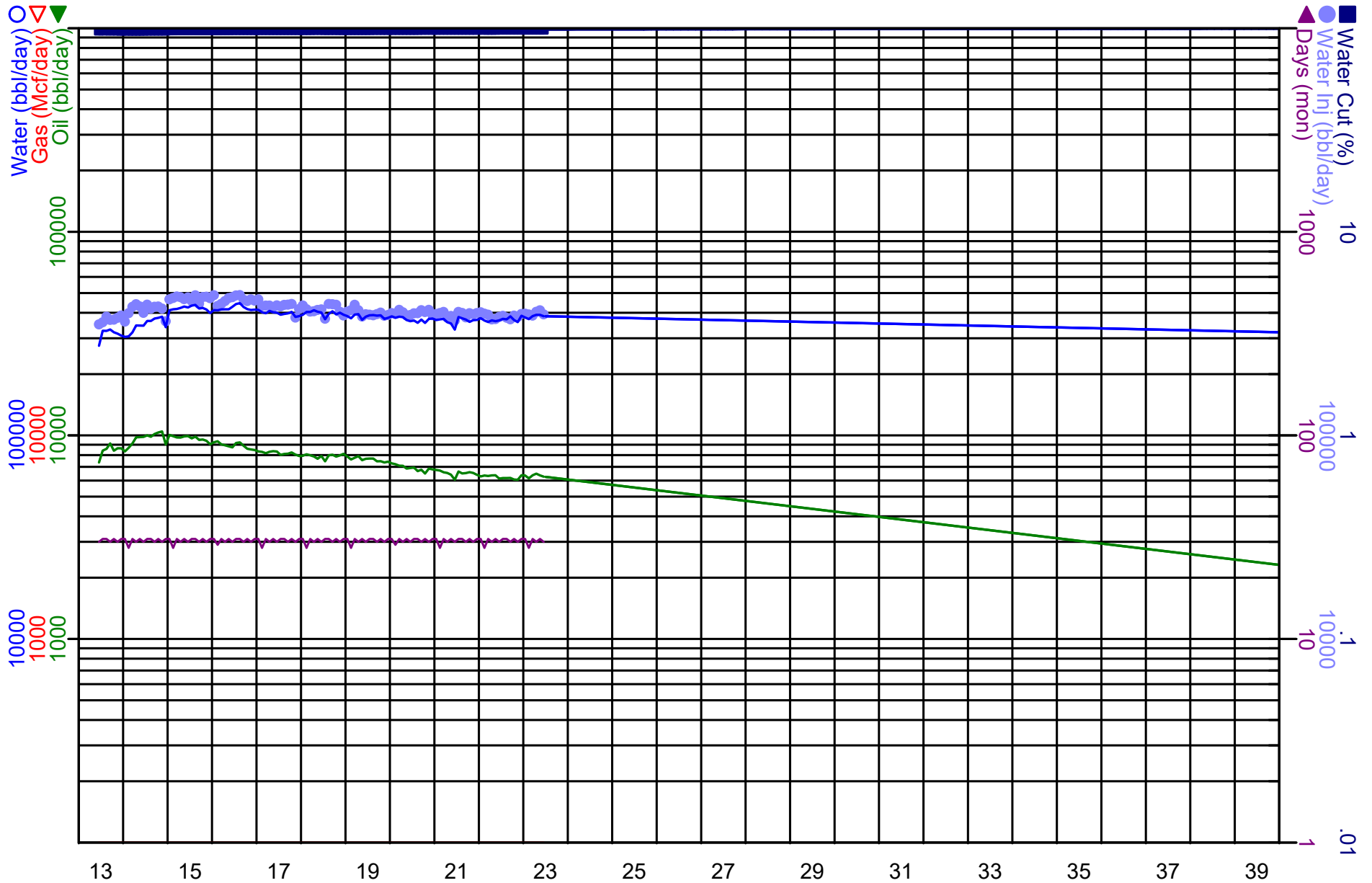
Proj Oil Cum: 77,828.70 Mbbbl
 Oil Rem: 55,046.42 Mbbbl
 Oil EUR: 132,875.11 Mbbbl

Proj Gas Cum: 0.00 MMcf
 Gas Rem: 0.00 MMcf
 Gas EUR: 0.00 MMcf

Exhibit 33A

Historical and Forecast Production

Tidelands Oil Production Company - All Wells



Proj Oil Cum: 30,245.12 Mbbbl
Oil Rem: 34,909.58 Mbbbl
Oil EUR: 65,154.70 Mbbbl

Proj Gas Cum: 0.00 MMcf
Gas Rem: 0.00 MMcf
Gas EUR: 0.00 MMcf

Tidelands Oil Prod Company
Lease
ALL

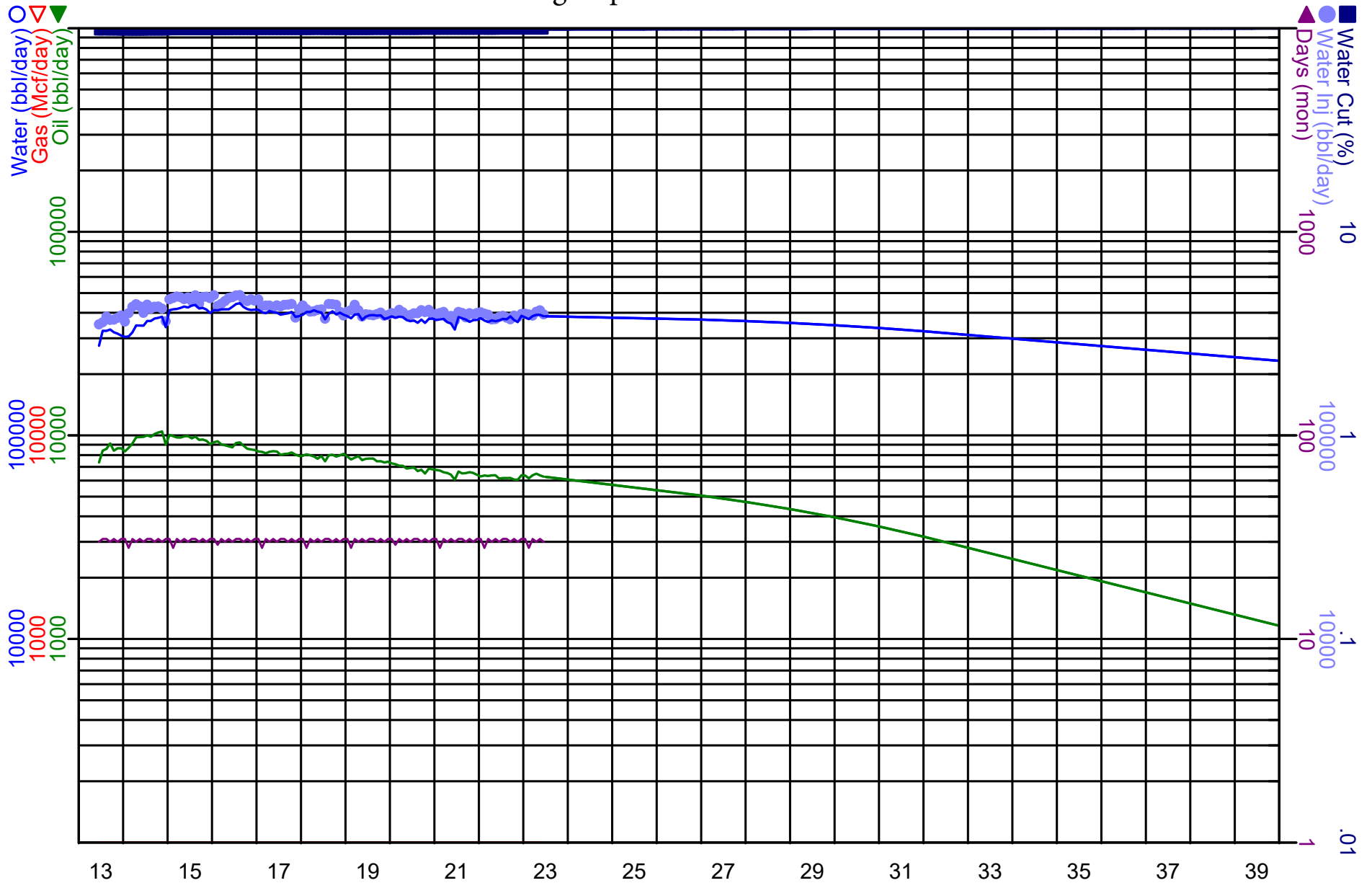
Exhibit 33B

Historical and Forecast Production

Tidelands Oil Production Company - All Wells

Assuming Implementation of SB 1137

Field: Wilmington
Los Angeles County, California
Proved Producing

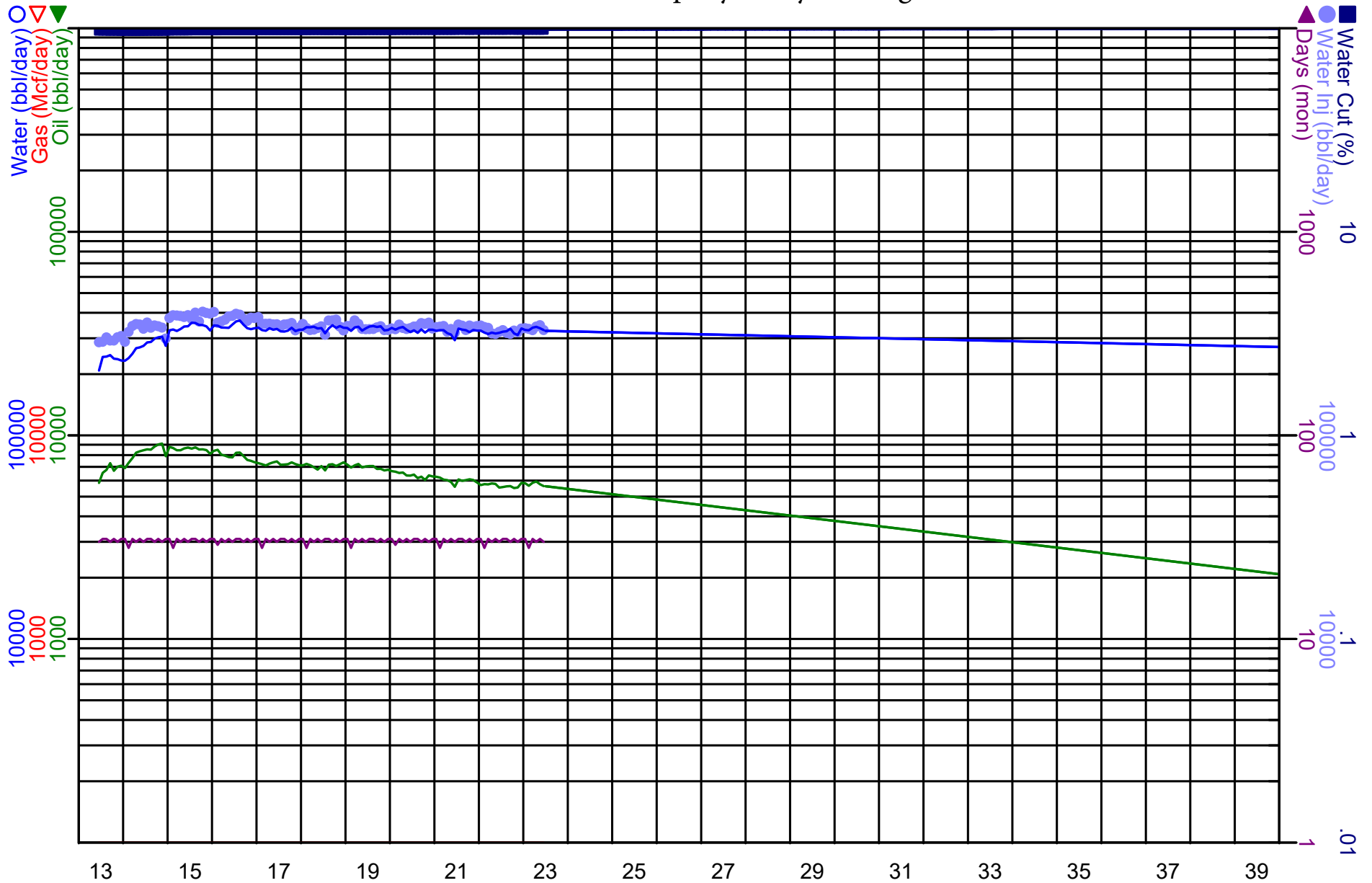


Proj Oil Cum: 30,245.12 Mbbbl
Oil Rem: 22,787.87 Mbbbl
Oil EUR: 53,033.00 Mbbbl

Proj Gas Cum: 0.00 MMcf
Gas Rem: 0.00 MMcf
Gas EUR: 0.00 MMcf

Historical and Forecast Production

Tidelands Oil Production Company - City of Long Beach Wells



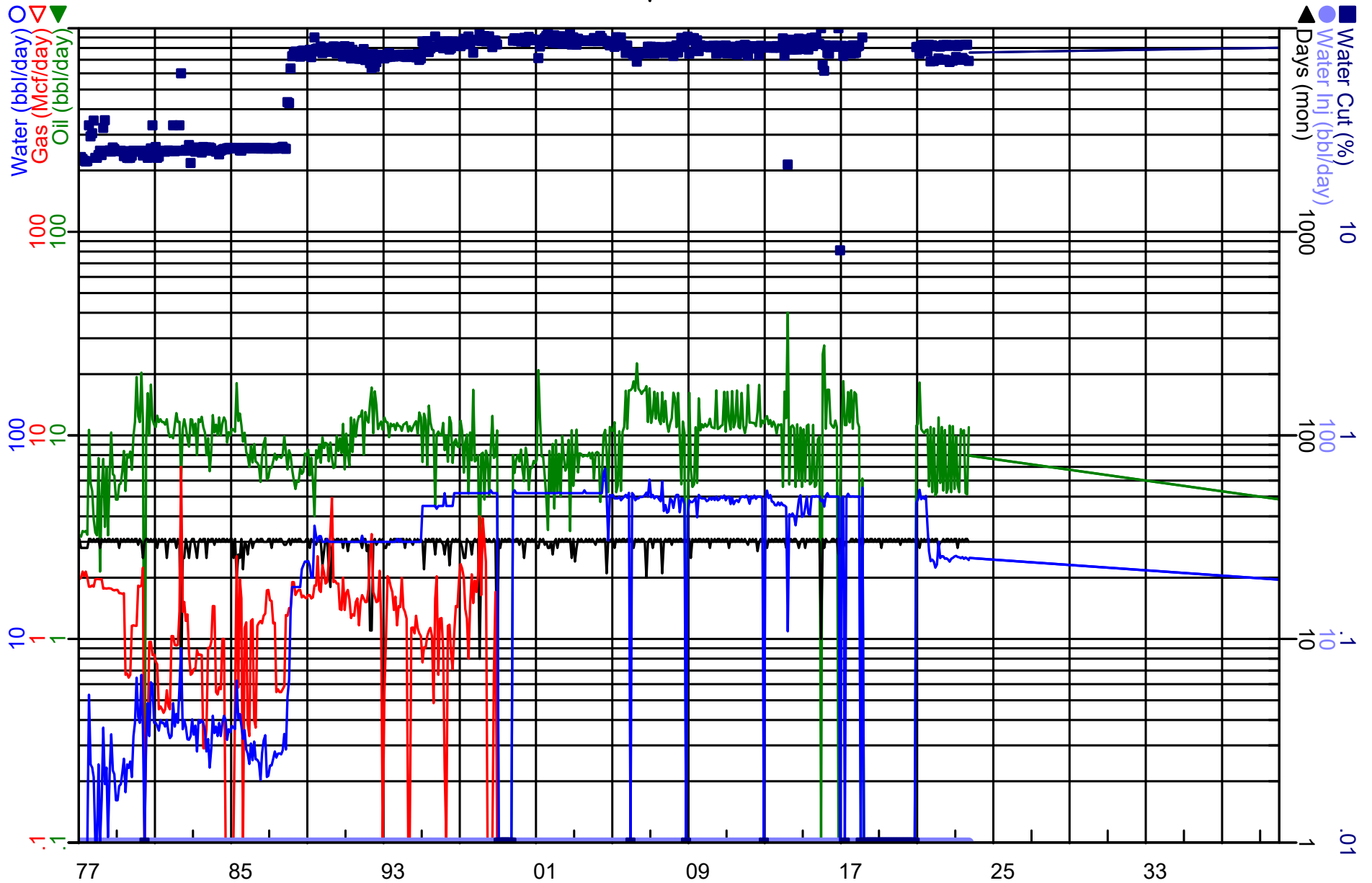
Proj Oil Cum: 26,931.81 Mbbbl
 Oil Rem: 31,418.62 Mbbbl
 Oil EUR: 58,350.43 Mbbbl

Proj Gas Cum: 0.00 MMcf
 Gas Rem: 0.00 MMcf
 Gas EUR: 0.00 MMcf

Exhibit 35

Historical and Forecast Production

TJ Scott Family Investments Fee 1

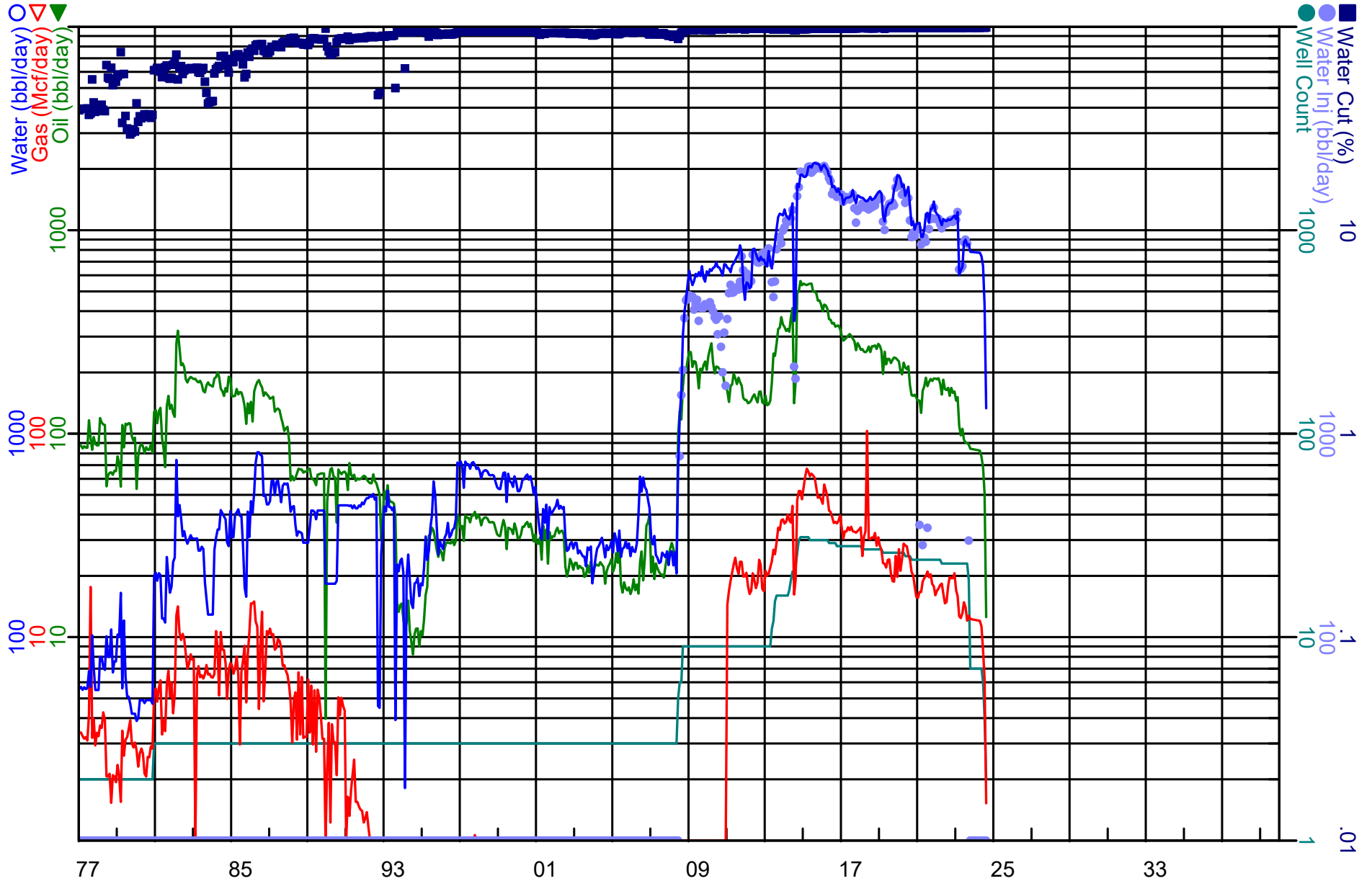


Proj Oil Cum: 152.80 Mbbbl
Oil Rem: 73.92 Mbbbl
Oil EUR: 226.72 Mbbbl

Proj Gas Cum: 9.98 MMcf
Gas Rem: 0.00 MMcf
Gas EUR: 9.98 MMcf

Exhibit 36 Historical and Forecast Production

Warren E and P - North Wilmington Unit (City of Long Beach Wells)



Proj Oil Cum: 2,171.03 Mbbbl
Oil Rem: 16.44 Mbbbl
Oil EUR: 2,187.47 Mbbbl

Proj Gas Cum: 166.53 MMcf
Gas Rem: 2.31 MMcf
Gas EUR: 168.84 MMcf

APPENDIX C

STAFF REPORT

82

A Statewide

11/29/17

S Statewide

S. Pemberton

CONSIDER SPONSORING STATE LEGISLATION IN THE SECOND HALF OF THE 2017-18 LEGISLATIVE SESSION TO AMEND PUBLIC RESOURCES CODE SECTION 6217.8 TO REMOVE THE \$300 MILLION CAP IN THE OIL TRUST FUND SO THAT THE ABANDONMENT FUND FOR THE LONG BEACH OIL OPERATIONS IS MORE LIKELY TO BE SUFFICIENT TO COVER THE STATE'S ABANDONMENT LIABILITY

SUMMARY:

This legislative proposal relates to the allocation of tidelands oil revenue for the future abandonment of the West Wilmington and Long Beach Unit oil operations in the city of Long Beach. Existing law establishes the Oil Trust Fund in the State Treasury to fund removal of oil and gas facilities, remediation, and plugging and abandonment of wells when the City of Long Beach oil operations cease. The Oil Trust Fund, financed by monthly contributions from revenue generated from the oil operations, is statutorily capped at \$300 million. The cap was reached in June 2014. Since then, the Fund has not grown and all interest earned, a total of \$4.4 million, has been transferred to the General Fund. According to the City of Long Beach Gas and Oil Department, the State's share of the abandonment liability is estimated to be approximately \$836 million, leaving a funding shortfall of \$536 million.

BACKGROUND AND DISCUSSION:

A large portion of the Wilmington Oil Field, one of the largest oil fields in the nation, is beneath the Long Beach tidelands. The Legislature granted these tide and submerged lands to the City in the early 1900s subject to the common law Public Trust Doctrine and the statutory trust grant. The grant included the mineral interests. The Wilmington Oil Field was discovered in 1937, and soon thereafter, the City began oil development and extraction operations in the tidelands. The oil operations include the Long Beach Unit and the West Wilmington Units established in the early and mid-1960s. The City is the unit operator and California Resources Corporation is the contractor responsible for day-to-day production and maintenance.

Even though the minerals are granted to the City, the State receives a share of the net profits that would otherwise go to the City as grantee. The State's share of revenue is deposited into the General Fund. Various unit and production agreements control the character of the oil operations, including the liability

STAFF REPORT NO. 82 (CONT'D)

associated with abandoning oil and gas wells and facilities. The State's share of liability is apportioned based on its net profit interest, among other factors. The State retains a large majority of the total abandonment liability at the end of the oil operations. While oil and gas wells are abandoned as a normal course of oil field operations, those costs are deducted as unit expenses and are paid prior to net profits being calculated. Once operations cease and revenue is no longer generated, the Oil Trust Fund will be the primary source to fund the substantial abandonment and decommissioning work that will be required to remove oil and gas facilities related to the oil operations.

In 2005, the Legislature enacted SB 71 (Senate Committee on Budget), which created the Oil Trust Fund in Public Resources Code section 6217.8 to fund abandonment costs after unit operations have ceased, i.e., when oil revenue generation is insufficient to cover those costs. The purpose of the legislation was to create an abandonment fund for the Long Beach operations. Public Resources Code section 6217.8 requires monthly deposits (\$2 million or 50 percent of monthly revenue, whichever is less) from the State's share of tidelands oil revenues until the Oil Trust Fund reaches \$300 million. The Commission may spend money in the Oil Trust Fund for well abandonment, pipeline removal, facility removal, remediation and other costs associated with removal of oil and gas facilities from the Long Beach tidelands that are not the responsibility of other parties. Money in the Oil Trust Fund can be used only after the City determines that oil revenue is insufficient to cover abandonment and decommissioning work—an event likely associated with the end of the Wilmington Oil Field's productive life.

The projected abandonment costs for the Long Beach oil operations have increased considerably because of updated market costs for abandonment work and reduced production forecasts from low oil prices. In recent years, the City of Long Beach Gas and Oil Department has estimated the abandonment liability at several hundred million dollars more than previously thought. The City of Long Beach Gas and Oil Department requested that California Resources Corporation provide an updated estimate for abandoning and decommissioning the wells, pipelines, and facilities. The analysis, attached as Exhibits A and B, is consistent with the City of Long Beach Gas and Oil Department estimates showing that end of field life abandonment and decommissioning will be more expensive than previously estimated. In the last fiscal year, the total abandonment liabilities increased by \$34.8 million. Now, the City of Long Beach Gas and Oil Department estimates that the State's potential unfunded liability, subtracting the \$300 million in the Oil Trust Fund, is approximately \$536 million.

When the Long Beach oil operations cease, which is projected to be around the year 2036, it will pose a problem for the State because the Oil Trust Fund is

STAFF REPORT NO. 82 (CONT'D)

inadequately funded to meet the State's liability obligations. The State can significantly reduce its unfunded liability by removing the \$300 million cap on the Oil Trust Fund and resume depositing a portion of the State's share of revenue from the Long Beach oil operations into the Oil Trust Fund.

EXHIBITS:

- A. California Resources Corporation: Full Field Abandonment; Opinion of Probable Cost, September 2017.
- B. Full Field Abandonment Cost Estimate, September 2017.
- C. 2018 Oil Field Abandonment Letter from the City of Long Beach Gas and Oil Department.

STAFF RECOMMENATION:

Staff believes that legislation is necessary to increase the \$300 million Oil Trust Fund cap. Staff recommends that the Commission sponsor legislation to remove the \$300 million cap in the Oil Trust Fund so that the abandonment fund for the Long Beach oil operations is more likely to be sufficient to cover the State's abandonment liability.

RECOMMENDED ACTION:

It is recommended that the Commission:

Sponsor legislation in the second half of the 2017-2018 legislative session to amend Public Resources Code section 6217.8 to remove the \$300 million cap in the Oil Trust Fund so that the Fund is more likely be sufficient to cover the State's potential abandonment liability.

EXHIBIT A



Full Field Abandonment

Opinion of Probable Cost

Revision 1
September 2017

Prepared by:



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714 969 0800

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3. BASIS OF ESTIMATE.....	6
4. COST ESTIMATE SUMMARY.....	13

ATTACHMENTS:

ATTACHMENT A - Estimate Detail Example:	Pipelines and Facilities
ATTACHMENT A-1	X&Y Tank Farm Removal
ATTACHMENT A-2	West of Vopak Removal
ATTACHMENT A-3	Island White Removal Estimate
ATTACHMENT B – Estimate Detail Example:	Island White Mass Removal
ATTACHMENT C – Estimate Detail Example:	Island White Remediation

REFERENCE DOCUMENTS

1. THUMS Drawing Exhibits, by SPEC Services, Inc., Revision A, dated 12-28-16 (3 sheets)
2. Tidelands Drawing Exhibits, by SPEC Services, Inc., Revision A, dated 12-21-16 (4 sheets)
3. Complete Cost Estimates (On File with CRC, Landmark Office):
 - a. 6747_FullFieldAbandonment_FacilitiesPipelines_CostEstFINAL_6 17 17.xlsx
 - b. 2017-05-23 CRC Final LBU Island Removal Estimate – Alternative 1.xlsx
 - c. 2017-05-23 CRC Final LBU Island Removal Estimate – Alternative 2.xlsx
 - d. 2017.05.25_ATTACHMENT A_CRC LBU THUMS End of Life Remediation Estimate.xlsx
 - e. 2017.05.25_ATTACHMENT B_CRC Tidelands End of Life Remediation Estimate.xlsx

1. EXECUTIVE SUMMARY

California Resources Corporation (CRC) is required to provide an abandonment cost estimate to the City of Long Beach on an annual basis for the Long Beach Unit (LBU, THUMS) and Tidelands. To support this effort, CRC engaged SPEC Services, Inc. (SPEC), Moffatt & Nichol (M&N) and Geosyntec Consultants (GEO) to collectively develop an opinion of probable cost (high level cost estimate) to remove all facilities and man-made oil production islands associated with LBU and Tidelands.

The cost estimate effort was divided up as follows:

- SPEC Services, Inc. Pipelines and Facilities Removal
- Moffatt & Nichol Island Land Mass Removal (THUMS only)
- Geosyntec Remediation Costs
- CRC (In-house) Well Abandonment

The approach for developing the removal cost estimates for Pipelines, Facilities and Two of the Island Land Masses included selecting representative facility sites to create the baseline for removal costs. Removal costs for the non-baseline sites were calculated by comparing their relative size and complexity to an appropriate baseline site. Unit costs were developed using historical data from relevant projects, budgetary information from local contractors and vendors, and recent project experience. The remediation costs were developed by calculating removal volumes at various depths, and estimating percentages of Total Petroleum Hydrocarbon (TPH)-impacted soils at each site by evaluating site use and history.

The opinion of probable cost for CRC End of Life Abandonment and Removal is summarized as follows:

CRC Unit	Description	Opinion of Cost	Opinion of Cost (Escalated to year 2040)
THUMS	Pipelines and Facilities	\$231,000,000	\$436,000,000
	Remediation	\$33,000,000	\$61,000,000
	Well Abandonment	\$369,000,000	\$697,000,000
	Totals:	\$633,000,000	\$1,195,000,000

	Island Removal 2-Islands (Off-Shore Disposal)	\$83,000,000	156,000,000
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Not Expected	Island Removal 2 Islands (On-Shore Disposal)	\$213,000,000	\$401,000,000
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Tidelands	Pipelines and Facilities	\$130,000,000	\$246,000,000
	Remediation	\$36,000,000	\$67,000,000
	Well Abandonment	\$231,000,000	\$435,000,000
	Totals:	\$397,000,000	\$718,000,000

2. BACKGROUND AND APPROACH

2.1. Project Background

The City of Long Beach Gas and Oil Department (LBGO) requested CRC to provide an updated cost estimate for the complete abandonment of all wells, pipelines and facilities for THUMS and Tidelands. LBGO is interested in improving the accuracy of its most recent estimate on file, which was derived by applying an escalation factor to the estimate from prior years.

Tidelands Facilities:

Tidelands operates its oil field in 28 separate operating and set-aside areas under land lease agreements with the Port of Long Beach. Tidelands oil field includes approximately 932 active production and water injection wells, with well heads located in individual and common concrete well cellars. The field is supported by three water plants/pump stations and two tank farms that process production fluids. The system is interconnected by a network of pipelines that carry production fluids between operating areas, water plants and tank farms.

THUMS Facilities:

THUMS is engaged in the drilling and production operations of oil and gas from production and injection wells on four manmade islands in Long Beach Harbor. THUMS operates additional wells on-shore at set-aside areas leased from the Port of Long Beach. THUMS operations includes 1,492 active wells, both off-shore and on-shore. THUMS facilities on the islands include oil and gas processing equipment required to transport the oil and gas on shore. On-shore, THUMS facilities include two tank farms and the Broadway and Mitchell (B&M) Gas Plant. The THUMS Power Plant is not part of the removal estimate, as it is assumed the Plant will be sold or transferred and continue to operate.

2.2. Project Approach

The abandonment cost estimate (Opinion of Probable Cost) includes removal of all CRC facilities, including all oil production wells, injection wells, pipelines, and support facilities operated by THUMS and Tidelands business units, and removal of two (2) islands plus soils remediation.

Pipelines and Facilities:

In the interest of controlling the cost of estimate development, the team identified representative facility sites to create the baseline for removal costs. Removal costs for the non-baseline sites were calculated by comparing their relative size and complexity to a comparable baseline site. Unit costs were developed using historical data from relevant projects, budgetary information from local contractors and vendors, and recent project experience.

The scope and cost of the removal was developed based on evaluating CRC facilities as they exist today. The cost estimate team realizes the oil field removal and abandonment would likely occur over several years. However, this cost estimate does not consider project schedule or phasing. Also, some wells and facilities in service today will be abandoned and/or removed before the major removal effort begins. The cost estimate is based on facilities in place at the time of publication.

The Opinion of Probable Cost was developed based on qualifications and exclusions considered reasonable and standard for this type of project. For example, removal of certain items are not included in the estimate because removal is considered not feasible. Examples include well casings below standard abandonment depth, horizontal directional drilled casings, railroad crossings, pipelines in active terminals and high traffic highways. For these items, the estimate includes procedures for abandoning in place. Refer to the Basis of Estimate section of this report for a complete listing of qualifications and exclusions.

Island Removal:

Island White was selected as a representative island for the estimate. Using the estimate from Island White, minor adjustments were made to develop estimates for the other islands. The quantities for each island are based on the best publicly available ocean depth records at the islands.

It is expected offshore disposal sites will be available during construction that are in the Port of LA/Port of Long Beach area or other sites within 5 miles, and economically viable for disposal of armor stone, quarry run, clean fill and concrete. It is anticipated as long as the material is not contaminated, offshore disposal could be permitted as the operation will be similar to any dredge disposal project in the area. However, if an offshore disposal site is not available, then onshore disposal will be required. Therefore, per LBGO direction, two Alternatives were estimated for the island removal:

- **Off-Shore Disposal:** Assumes armor stone, quarry run, clean island fill and concrete are able to be disposed offshore.
- **On-Shore Disposal:** Assumes all island deconstruction material are required to be disposed onshore.

Remediation:

Estimated volumes of Total Petroleum Hydrocarbon (TPH)-impacted soils were developed using GIS and CADD data-files provided by CRC for THUMS and Tidelands. The aerial footprint of each parcel

was used to calculate volumes of TPH-impacted soils assuming excavation extended across the parcel to one-foot below grade surface (bgs), two and one-half feet bgs, or five feet bgs. Based on the parcel location, use and history, and discussions with CRC, one of the calculated volumes was selected to estimate cost to remediate the parcel.

Once the calculated volume was selected, additional costs-per-ton for soil handling, waste disposal, permitting, storm water best management practices, etc., were incorporated into the estimates. The use of calculated volumes of TPH-impacted soil to develop these cost estimates was in lieu of conducting a remedial investigation, i.e., advancing soil borings to collect parcel-specific soil data. If remedial investigations are conducted in the future, that data may result in cost increases or decreases with respect to these estimates.

Well Abandonment:

CRC developed average costs for abandonment of production and injection wells at THUMS and Tidelands operating areas, based on abandonments performed for recent projects in the Port area, including the Gerald Desmond Bridge Replacement and Middle Harbor.

Disclaimer Statement:

This Opinion of Probable Cost was developed by quantifying the scope and costs for full field abandonment of CRC assets including pipelines, facilities, island removal, and remediation. Quantities were estimated from data/information provided by CRC; hence the estimate is believed to be comprehensive. However, it is possible that miscellaneous items may have been unknowingly omitted.

3. BASIS OF ESTIMATE

3.1. List of Facilities

The assets to be considered in the abandonment cost estimate include all Tidelands and THUMS pipelines and facilities, specifically:

3.1.1. General:

- Well cellars and support facilities for all production and injection wells.
- Underground and above ground pipelines, including supports.
- Electrical substations, load centers, MCCs, duct banks, above ground conduit, supports and related equipment.
- Production field equipment including AWTs, DVMs, valve stations, and similar components.
- Tanks/vessels, pumps, compressors, gas treatment equipment, support structures, foundations, piping, electrical equipment and buildings at the facility locations listed below.

3.1.2. Tidelands Facilities:

The following Tidelands facilities are included in the cost estimate. Baseline facilities are shown in **bold text**.

3.1.2.1. Oil Field Set-Aside Areas and Operating Areas:

- Pier A West
- NC Lease
- West of Carrack
- **West of Vopak**, and adjacent Tidelands Warehouse and Pipe Yard
- Pier S, Area 1 and Area 3
- W-Strip
- **Parcel A (A-7)**
- Pier A East New
- Ultramar Strip
- South of HCC
- TM-13
- TM-14
- South of Toyota
- Standard Lease
- A-4
- A-8 (North Flank)
- A-9 (Reef)
- Pier G
- B-1
- Pier C
- D-1, D-2, D-3 and D-4
- E-2, E-5 and E-13
- J-Leases
- Z1 Lease

3.1.2.2. **X&Y Tank Farm**

3.1.2.3. **Z Water Plant**

3.1.2.4. Z1-2 Tank Farm

3.1.2.5. Warehouse/South Maintenance Yard (A-6)

3.1.2.6. Slurry Process Facility, A-1 and A-1A

3.1.2.7. J Water Plant

3.1.2.8. F Water Plant (A-2)

3.1.3. THUMS Facilities:

The following THUMS facilities are included in the cost estimate. Baseline facilities are shown in **bold text**.

- 3.1.3.1. **B&M Gas Plant**
- 3.1.3.2. THUMS production islands: **Island White**, Island Freeman, Island Chaffee, Island Grissom.
- 3.1.3.3. J-1, J-3, J-4 and J-5
- 3.1.3.4. **J-2 Tank Farm**
- 3.1.3.5. J-6 Tank Farm
- 3.1.3.6. ANC-1 Maintenance Yard
- 3.1.3.7. THUMS Office Building, Warehouse and Docks
- 3.1.3.8. THUMS Drilling Yard

3.2. Common Assumptions

- 3.2.1. This cost estimate is an 'Opinion of Probable Construction Cost' made by consultants. In providing opinions of construction cost, it is recognized that neither the client nor the consultant has control over the cost of labor, equipment, materials, or the contractor's means and methods of determining constructability, pricing or schedule. This opinion of construction cost is based on the consultant's reasonable professional judgment and experience and does not constitute a warranty, expressed or implied, that contractor's bids or negotiated prices for the work will not vary from this opinion of cost.
- 3.2.2. A 30% contingency has been included to cover undefined items, due to the level of engineering carried out at this time. The contingency is not a reflection of the accuracy of the estimates but covers items of work which will have to be performed, and elements of costs which will be incurred, but which are not explicitly detailed or described due to the level of investigation, engineering and estimating completed today.
- 3.2.3. Owner overhead is included at 10% before contingency.
- 3.2.4. The estimate, including the contingency, is considered accurate to -30% to +50%.
- 3.2.5. For CRC accounting purposes, estimated costs have been allocated to each oil production fault block on a percentage basis.
- 3.2.6. Union wage rates were considered in the development of this estimate.
- 3.2.7. Separately, an escalation factor was applied to estimate totals using Engineering News Record (ENR) Construction Cost Index (CCI) average for the last 10 years in City of Los Angeles. The resulting 2.8% index was extrapolated to the year 2040.
- 3.2.8. Construction management cost was factored at 5%.
- 3.2.9. Assumes permits will be required from applicable local, state and federal jurisdictions, including but not limited to:
 - 3.2.9.1. South Coast Air Quality Management District (Rule 219 (n)) exempts Natural Gas and Crude Oil Production Equipment, however, permits are expected for abandonment, decommissioning and/or remediation activities.
 - 3.2.9.2. LA Regional Water Quality Control Board. Assumes LA RWQCB maintains role as lead agency. LA RWQCB is current lead agency for remediation at Parcel A-7. If additional contamination is found prior to, or during decommissioning activities, it

is possible for Cal DTSC and/or Cal EPA to become involved in oversight of environmental abandonment activities.

- 3.2.9.3. City of Long Beach, specifically, Title 12 Long Beach Oil Code. Sections 12.08 Tidelands Areas, 12.12 Permits, 12.20 Derricks, and 12.36 Abandonment. This code section is detailed for oil and gas production with little focus on abandonment. This code may be updated with additional abandonment and restoration requirements as the timeline for abandonment activities narrows.
- 3.2.9.4. CA Division of Oil, Gas, and Geothermal Resources.
- 3.2.9.5. State Lands Commission.
- 3.2.9.6. Harbor Development (POLB).
- 3.2.9.7. Environmental Impact Report (EIR). Due to uncertainty, the cost of an EIR is not included.
- 3.2.9.8. Army Corp of Engineers
- 3.2.9.9. California Coastal Commission

3.3. Pipelines and Facilities – Assumptions

- 3.3.1. Removal costs for non-baseline facilities were estimated by reviewing site locations and applying a percentage to removal cost for a comparable baseline facility.
- 3.3.2. For set-aside and operating areas, removal costs were estimated from detailed take-offs performed for two (2) areas: West of Vopak and Parcel A. The two estimates resulted in an average cost per well which was used to estimate removal costs of the remaining areas.
- 3.3.3. The estimate is based on the following backfill assumptions:
 - 3.3.3.1. 10% slurry backfill
 - 3.3.3.2. 90% native soil backfill.
 - 3.3.3.3. 0% import soil backfill (included in remediation costs).
- 3.3.4. Site grade elevations will be returned to match existing to the extent possible.
- 3.3.5. Estimate includes a salvage value for material removed from tank farms and process facilities, calculated at 2% of removal cost.
- 3.3.6. Estimate does not include removal of old, previously abandoned lines, inclusive of Lomita, UPRC, Mobil Lease lines or regulated pipelines north of B&M Gas Plant.
- 3.3.7. Removal scope under the Pier B On-Dock Rail Yard project is not included. The estimate does include removal of pipelines “proposed” under the Pier B On-Dock Rail Yard project.
- 3.3.8. Estimate assumes major permits for the work will include Harbor Development Permits only.
- 3.3.9. Wells:
 - 3.3.9.1. CRC well work group will disconnect wells and remove well heads during well abandonment.
 - 3.3.9.2. Removal of common well cellar structures is included in the facilities portion of the estimate. Individual well cellars will be removed during well abandonment.
- 3.3.10. Estimate includes product removal, cleaning and pigging of pipelines.

- 3.3.11. Where existing lines are under public streets, 40% will be removed and 60% will be abandoned in place.
- 3.3.12. 75% of pipelines in terminals will be abandoned in place.
- 3.3.13. Sub-sea electrical lines: conductors and dielectric oil will be removed. Conduits and casings will be capped at each end and abandoned in place.
- 3.3.14. Sub-sea pipelines will be drained, pigged and cleaned and mud-jacked in place.
- 3.3.15. Inaccessible pipelines will be cut, mud-jacked, capped and abandoned in place.
- 3.3.16. Inaccessible casings will be mud-jacked and abandoned in place, such as casings in HDDs and at railroad crossings.
- 3.3.17. Duct banks:
 - 3.3.17.1. THUMS/Tidelands: In operating areas, duct banks will be completely removed. Duct banks in public streets and Terminals: conductors will be removed, and conduits/concrete will not be removed.
- 3.3.18. Removal of CRC idle pipelines is included, with percentages as described herein.
- 3.3.19. Estimate includes cleaning of tanks and vessels.
- 3.3.20. Civil and Structural:
 - 3.3.20.1. Foundations, spread footings and mat slabs are estimated using an average depth of 3 feet.
 - 3.3.20.2. Non-foundation slab-on-grade concrete is estimated using an average depth of 1 foot.
 - 3.3.20.3. Concrete piles and drilled piers will be abandoned in place 5 feet below grade.
 - 3.3.20.4. Storm water systems at Pier A West and S-1 will remain; includes retention basins and pump station.
- 3.3.21. THUMS Islands:
 - 3.3.21.1. Steel and other construction materials will be barged from island to mainland for disposal.
 - 3.3.21.2. Concrete will be cleaned and disposed off shore.
- 3.3.22. Estimate includes removal of cathodic protection equipment.

3.4. Island Removal Assumptions

- 3.4.1. Contaminated soil (hydrocarbons) disposal assumes 2% of the soil is contaminated with hydrocarbons, is Class II and can be transported and disposed of at a facility (e.g., McKittrick Waste Treatment Site) within a 3-4 hour drive from Long Beach at a rate of \$70/ton. Additional costs to excavate, transport, and offload the material at the Port of Long Beach are estimated to be \$23/ton.
- 3.4.2. Contaminated soil (hazardous) disposal assumes 0.1% of the soil is contaminated with PCBs, metals and/or solvents, is Class I RCRA waste and can be transported and disposed of at a facility (e.g. Kettleman Hills Chemical Waste Management Site) within a 4-5 hour drive from Long Beach at a rate of \$120/ton plus an additional hazardous waste disposal fee of \$55/ton. Additional costs to excavate, transport, and offload the material at the Port of Long Beach are estimated to be \$45/ton.

- 3.4.3. **Off-Shore disposal** - assumes offshore disposal location is available for armor stone, quarry run, and clean island fill in close proximity to Long Beach Harbor or within 5 miles.
- 3.4.4. **Onshore disposal option** - costs for Armor Stone, Quarry Run, Clean Island Fill assume waste is transported and disposed of at a facility 2 hours away from the Port of Long Beach. Concrete Retaining Wall, Deadman, and Concrete Decorative Walls is assumed to be trucked 30 minutes to Hanson Aggregates, a disposal site in Long Beach.
- 3.4.5. Mobilization / demobilization costs based on a US-based west-coast contractor.

3.5. Remediation Assumptions

- 3.5.1. Oversight and management costs are provided as a percent of the remediation estimate prepared for each parcel.
- 3.5.2. In general, the remediation estimates include costs for oversight and management, excavation of TPH-impacted soils to a maximum depth of five (5) feet below grade, backfill of excavation areas, off-site transportation and disposal of TPH-impacted soils, laboratory analytical costs for waste profiling, laboratory analytical costs to confirm excavation limits, dust monitoring, SWPPP BMPs, select permit application fees and agency coordination. Constituents of Concern (COCs) addressed in the remediation estimate are limited to Total Petroleum Hydrocarbons (C4 – C44). Other COCs are not considered in the development of this estimate. Inclusion of additional COCs will require these estimates to be updated.
- 3.5.3. A level of effort lump sum of \$5,000 is included for each parcel to prepare a final letter-report for submittal to an oversight agency to document completion of remediation activities.
- 3.5.4. NORM is known to be present in isolated facilities within the LBU and the cost associated with NORM is included in the Pipelines and Facilities portion of the estimate.
- 3.5.5. Potential sediment accumulation in the Port from THUMS and/or Tidelands operations are not evaluated or included in these estimates.
- 3.5.6. Remediation equipment utilized will be standard in nature (i.e. excavator, front-end loader, backhoe, compaction wheel, water truck, etc.) and will need to meet South Coast Air Quality Monitoring District Tier 3 or Tier 4 requirements.
- 3.5.7. GIS files provided by CRC for THUMS and Tidelands used to generate square footage of each parcel. The square footage of each parcel was then used to calculate estimated volumes of TPH-impacted soils at the parcel. Tables showing GIS area (square footage) and estimated volumes of TPH-impacted soils for each parcel to one-foot bgs, two and one-half feet bgs, and five feet bgs are included in the estimate prepared for each parcel.
- 3.5.8. On-site soil handling includes soil excavation, handling and stockpiling, environmental sampling, backfill and compaction.
- 3.5.9. Maximum excavation depths of five (5) feet below grade at are assumed at the THUMS and Tidelands sites, unless otherwise specified. Select parcels assume excavation depths greater than five (5) feet below grade based on available data.

- 3.5.10. TPH-impacted soil excavation extent will be limited to THUMS and Tidelands parcel boundaries.
- 3.5.11. Excavated TPH-impacted soils will be hauled off-site for disposal.
- 3.5.12. Excavated clean overburden will be stockpiled on-site and re-used as backfill as appropriate.
- 3.5.13. Confirmation environmental soil samples will be collected from excavation limits and regulatory requirements.
- 3.5.14. Environmental soil samples will be submitted to an appropriate environmental laboratory for analysis.
- 3.5.15. Off-site transportation and disposal will utilize standard 18-ton capacity end-dump trucks.
- 3.5.16. Off-site soil handling includes trucking and disposal TPH-impacted soils classified as non-hazardous or hazardous waste streams.
- 3.5.17. TPH-impacted soils with concentrations less than 1,000 mg/kg can be reused within the Port and do not require off-site transportation or disposal.
- 3.5.18. Non-hazardous TPH-impacted soil disposal costs developed for Clean Harbors facility located in Buttonwillow, CA.
- 3.5.19. Hazardous TPH-impacted soil disposal costs developed for Kettleman City facility located in Kettleman City, CA.
- 3.5.20. Waste disposal fees and taxes applicable for January 2017.
- 3.5.21. Costs for demolition of all on-shore, at-grade and below-grade oil and gas related facilities for THUMS and Tidelands are included in Pipelines and Facilities.
- 3.5.22. Costs for on-shore demolition are included in Pipelines and Facilities.
- 3.5.23. Assumes groundwater is not impacted and/or will not require remediation.
- 3.5.24. Groundwater is tidally influenced and may fluctuate in depth, affecting excavation depths and access.
- 3.5.25. Costs for clean soil import are included.
- 3.5.26. Access to the site is assumed to be unimpeded by demolition of existing facilities or structures, Port facilities, Port activities, etc.
- 3.5.27. Assumes LARWQCB will be the regulatory oversight agency during remediation activities.
- 3.5.28. Completion of initial remedial investigation activities to determine spatial distribution, depth, and concentration of TPH-impacted soils may affect the estimates provided.

3.6. Well Abandonment Assumptions

- 3.6.1. Well abandonment costs are included as an average cost per well based on recent historical data for well abandonment work.
- 3.6.2. Well count includes active and idle wells in the oil field as of the date of the estimate.
- 3.6.3. The cost estimate does not include a future projection for added or removed wells.
- 3.6.4. Wells will be abandoned to surface.
- 3.6.5. Removal of conductor and casing for island wells will be to 5 feet below mud line.
- 3.6.6. Estimate includes water source well abandonment.

3.7. Specific Exclusions

- 3.7.1. Removal and reassignment of the THUMS Power Plant at Pier D.
- 3.7.2. HDD removal, except as described herein.
- 3.7.3. Re-abandonment of existing abandoned wells.
- 3.7.4. Inaccessible duct banks or casings.
- 3.7.5. Groundwater characterization, sampling and remediation.
- 3.7.6. Lead paint, asbestos or other hazardous materials abatement or removal. Estimate includes testing costs.
- 3.7.7. Permanent fencing or other permanent improvements.
- 3.7.8. Agency oversight costs.
- 3.7.9. Coastal Commission approval or interface.
- 3.7.10. Estimate excludes business disruption cost for terminals, tenants, adjacent businesses, etc.
- 3.7.11. Maintenance costs – operations revenue will cover maintenance costs until the field is uneconomic, and no maintenance is expected after cessation of operations.

4. COST ESTIMATE SUMMARY

4.1. Overall Cost Summaries

**OPINION OF PROBABLE COST
 THUMS OVERALL SUMMARY**

	Total Removal Cost 2017	Escalation to Year 2040	Total Including Escalation
Pipelines and Facilities	\$ 231,000,000	\$ 205,000,000	\$ 436,000,000
Remediation Estimate	\$ 33,000,000	\$ 28,000,000	\$ 61,000,000
Well abandonment	\$ 369,000,000	\$ 328,000,000	\$ 697,000,000
Totals:	\$ 633,000,000	\$ 562,000,000	\$ 1,195,000,000

**Total Number of Active & Idle
 Wells: 1,492**

Island Removal 2 Islands (Off-Shore Disposal)	\$ 83,000,000	\$ 73,000,000	\$ 156,000,000
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Island Removal 2 Islands (On-Shore Disposal)	\$ 213,000,000	\$ 188,000,000	\$ 401,000,000
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**OPINION OF PROBABLE COST
Tidelands OVERALL SUMMARY**

	Total Removal Cost 2017	Escalation to Year 2040	Total Including Escalation
Pipelines and Facilities	\$ 130,000,000	\$ 116,000,000	\$ 246,000,000
Remediation Estimate	\$ 36,000,000	\$ 31,000,000	\$ 67,000,000
Well abandonment	\$ 231,000,000	\$ 204,000,000	\$ 435,000,000
Grand Total:	\$ 397,000,000	\$ 321,000,000	\$ 718,000,000

Total Number of Active & Idle Wells: 932

4.2. THUMS Pipelines and Facilities - Cost Summary

THUMS PIPELINES AND FACILITIES							
	Construction	Engineering	Construction Management	CRC/State/City Overhead	Contingency	Total	
Island White	\$ 27,600,000	\$ 2,760,000	\$ 1,380,000	\$ 2,760,000	\$ 9,500,000	\$ 44,000,000	
B&M Gas Plant	\$ 4,220,000	\$ 420,000	\$ 211,000	\$ 420,000	\$ 1,500,000	\$ 6,800,000	
Power Generation Plant							
Island Freeman	\$ 26,270,000	\$ 2,630,000	\$ 1,313,500	\$ 2,630,000	\$ 9,100,000	\$ 41,900,000	
Island Chaffee	\$ 31,420,000	\$ 3,140,000	\$ 1,571,000	\$ 3,140,000	\$ 10,800,000	\$ 50,100,000	
Island Grissom	\$ 25,270,000	\$ 2,530,000	\$ 1,263,500	\$ 2,530,000	\$ 8,700,000	\$ 40,300,000	
Thums Pier J Storage	\$ 60,000	\$ 10,000	\$ 3,000	\$ 10,000	\$ 20,000	\$ 100,000	
J-1, J-3, J-4, J-5 (SAAs)	\$ 5,240,000	\$ 520,000	\$ 262,000	\$ 520,000	\$ 1,800,000	\$ 8,300,000	
Thums J-2 Tank Farm	\$ 5,960,000	\$ 600,000	\$ 298,000	\$ 600,000	\$ 2,100,000	\$ 9,600,000	
Thums J-6 Tank Farm	\$ 5,040,000	\$ 500,000	\$ 252,000	\$ 500,000	\$ 1,700,000	\$ 8,000,000	
ANC-1 Maintenance Yard	\$ 60,000	\$ 10,000	\$ 3,000	\$ 10,000	\$ 20,000	\$ 100,000	
THUMS Office Bldg., Warehouse & Dock	\$ 300,000	\$ 30,000	\$ 15,000	\$ 30,000	\$ 100,000	\$ 500,000	
THUMS Systems	\$ 11,220,000	\$ 1,120,000	\$ 561,000	\$ 1,120,000	\$ 3,900,000	\$ 17,900,000	
THUMS Active & Idle Wells	\$ 2,430,000	\$ -	\$ 121,500	\$ 240,000	\$ 800,000	\$ 3,600,000	
Subtotals - THUMS	\$ 145,090,000	\$ 14,270,000	\$ 7,254,500	\$ 14,510,000	\$ 50,040,000	\$ 231,200,000	

4.3. Tidelands Pipelines and Facilities - Cost Summary

TIDELANDS PIPELINES AND FACILITIES						
	Construction	Engineering	Construction Management	CRC/State/City Overhead	Contingency	Total
X & Y Tank Farm	\$ 9,170,000	\$ 920,000	\$ 458,500	\$ 920,000	\$ 3,200,000	\$ 14,700,000
Z Water Plant	\$ 1,980,000	\$ 200,000	\$ 99,000	\$ 200,000	\$ 700,000	\$ 3,200,000
West of Vopak	\$ 970,000	\$ 100,000	\$ 48,500	\$ 100,000	\$ 300,000	\$ 1,500,000
Parcel A (A-7)	\$ 1,840,000	\$ 180,000	\$ 92,000	\$ 180,000	\$ 600,000	\$ 2,900,000
Warehouse / Pipe Yard (West of Vopak)	\$ 400,000	\$ 40,000	\$ 20,000	\$ 40,000	\$ 100,000	\$ 600,000
Other Tidelands SAAs	\$ 21,400,000	\$ 2,140,000	\$ 1,070,000	\$ 2,140,000	\$ 7,400,000	\$ 34,200,000
W-Strip						Included
Pier S, Area 1 and Area 3						Included
Pier A West						Included
Pier A East New						Included
NC Lease						Included
Ultramar Strip						Included
South of HCC						Included
West of Carrack						Included
TM-13, TM-14						Included
South of Toyota						Included
Standard Lease						Included
A-4, A-8 (North Flank), A-9 (Reef)						Included
B-1 NEW						Included
Pier C						Included
D-1, D-2, D-3, D-4						Included
E-2, E-5, E-13						Included
J-Leases						Included
Z1 Lease						Included
Warehouse / Pipe Yard (West of Vopak)	\$ 100,000	\$ 10,000	\$ 5,000	\$ 10,000	\$ 30,000	\$ 200,000
Warehouse/South Maintenance Yard (A-6)	\$ 400,000	\$ 40,000	\$ 20,000	\$ 40,000	\$ 100,000	\$ 600,000
Slurry Proc Facility, A-1 and A-1A	\$ 600,000	\$ 60,000	\$ 30,000	\$ 60,000	\$ 200,000	\$ 1,000,000
J Water Plant (J-7)	\$ 590,000	\$ 60,000	\$ 29,500	\$ 60,000	\$ 200,000	\$ 900,000
F Water Plant (A-2)	\$ 400,000	\$ 40,000	\$ 20,000	\$ 40,000	\$ 100,000	\$ 600,000
Z1-2 Tank Farm	\$ 5,500,000	\$ 550,000	\$ 275,000	\$ 550,000	\$ 1,900,000	\$ 8,800,000
Tidelands Systems	\$ 24,280,000	\$ 2,430,000	\$ 1,214,000	\$ 2,430,000	\$ 8,400,000	\$ 38,800,000
Tidelands Active & Idle Wells	\$ 13,980,000	\$ 1,400,000	\$ 699,000	\$ 1,400,000	\$ 4,800,000	\$ 22,300,000
Subtotals - TIDELANDS	\$ 81,610,000	\$ 8,170,000	\$ 4,080,500	\$ 8,170,000	\$ 28,030,000	\$130,300,000

4.4. Island Removal Cost Summary

Island White Removal Estimate			
Item			Total Cost
Remove Rock Perimeter and Quarry Run			\$5,085,000
Remove Sand Fill (Clean Only, Contaminated is by Others)			\$15,103,000
Remove Sea Wall, Sheetpile Walls, and Asphalt Topping			\$2,198,000
Remove Barge Ramp			\$56,000
Remove Landscape and Replant Trees			\$269,000
Remove Decorative Concrete Walls			\$423,000
Remove Boat Landing and Timber Piles			\$200,000
Remove Well Conductors/Casings (cost provided by Others)			\$7,445,000
Island White Removal Total			\$30,779,000
TOTAL PROJECT REMOVAL COSTS			
ITEM			COST
ISLAND WHITE REMOVAL TOTAL			\$30,800,000
ISLAND GRISSOM REMOVAL TOTAL			\$36,500,000
ISLAND CHAFFEE REMOVAL TOTAL			\$34,000,000
ISLAND FREEMAN REMOVAL TOTAL			\$48,600,000
THUMS ISLAND REMOVAL TOTAL			\$ 149,900,000

4.5. Remediation Cost Summary

HIGH-LEVEL REMEDIATION COST ESTIMATE FOR CRC THUMS SET-ASIDE AREAS AND ISLANDS	
Off-Shore Islands:	
Island Name	SUBTOTAL ESTIMATE
Island White	\$ 3,423,000
Island Grissom	\$ 4,605,000
Island Chaffee	\$ 3,997,000
Island Freeman	\$ 6,692,000
SUBTOTAL FOR OFF-SHORE ISLANDS: \$ 18,717,000	
Pier D THUMS Set-Aside Areas:	
Set-Aside Area Name	SUBTOTAL ESTIMATE
B&M (Parcels A&B Combined)	\$ 761,000
Power Plant	\$ -
SUBTOTAL FOR PIER D: \$ 761,000	
Piers E, F, G and H THUMS Set-Aside Areas:	
Set-Aside Area Name	SUBTOTAL ESTIMATE
Harbor Plaza	\$ 12,000
A-7A	\$ 8,000
Pier G	\$ 508,000
Barge Ramp [Pier G (Parcels C, D, E combined)]	\$ 319,000
SUBTOTAL FOR PIERS E, F, G & H: \$ 847,000	
Pier J THUMS Set-Aside Areas:	
Set-Aside Area Name	SUBTOTAL ESTIMATE
Pier J Facilities A	\$ 208,000
Pier J Facilities B	\$ 44,000
Pier J Facilities (D, E, and F Combined)	\$ 7,170,000
J-4	\$ 73,000
J6	\$ 4,652,000
SUBTOTAL FOR PIER J: \$ 12,147,000	
Other THUMS Set-Aside Area:	
Set-Aside Area Name	SUBTOTAL ESTIMATE
Pico Road Electrical Substation	\$ 84,000
SUBTOTAL FOR OTHER THUMS AREAS: \$ 84,000	
REMEDICATION ESTIMATE SUBTOTAL FOR THUMS SET-ASIDE AREAS AND OFF-SHORE	SUBTOTAL ESTIMATE
	\$ 32,556,000

HIGH-LEVEL REMEDIATION COST ESTIMATE FOR CRC TIDELANDS SET-ASIDE AREAS

North Tidelands, Pier A, A west, and Pier B Set-Aside Areas:

Set-Aside Area Name	SUBTOTAL ESTIMATE
Standard Injection Plant	\$ 550,000
Boneyard	\$ 29,000
Edison Hole (South of Toyota Yard)	\$ 1,027,000
West of Carrack	\$ 1,063,000
South of HCC (A and B)	\$ 534,000
Ultramar Strip	\$ 427,000
Pier A West Area 4	\$ 1,168,000
NC Lease	\$ 1,528,000
SUBTOTALS FOR NORTH TIDELANDS, PIER A, A WEST, AND PIER B:	\$ 6,326,000

North Tidelands, Pier S and Pier T Set-Aside Areas:

Set-Aside Area Name	SUBTOTAL ESTIMATE
Warehouse Pipe Yard	\$ 21,000
West of Vopak	\$ 1,168,000
W Strip (W-6A, W-5, W-4)	\$ 1,060,000
Pier S Area 3	\$ 588,000
Pier S Area 1	\$ 866,000
E-2	\$ 643,000
E-13	\$ 49,000
E-5	\$ 704,000
SUBTOTALS FOR NORTH TIDELANDS AND PIER S & T:	\$ 5,099,000

Pier C Set-Aside Areas:

Set-Aside Area Name	SUBTOTAL ESTIMATE
TM-13	\$ 88,000
TM-14	\$ 163,000
TM-15	\$ 74,000
SUBTOTAL FOR PIER C:	\$ 325,000

Pier D Tidelands Set-Aside Areas:

Set-Aside Area Name	SUBTOTAL ESTIMATE
X&Y Tank Farm	\$ 6,581,000
D-1	\$ 271,000
D-2	\$ 801,000
D-3	\$ 235,000
D-4	\$ 391,000
SUBTOTAL FOR PIER D:	\$ 8,279,000

Piers E, F, G and H Tidelands Set-Aside Areas:	
Set-Aside Area Name	SUBTOTAL ESTIMATE
B-1	\$ 608,000
A-10	\$ 981,000
A-8	\$ 372,000
A-6 (Warehouse/ S Maintenance Yard)	\$ 906,000
A-5A, Z-1 Lease	\$ 1,140,000
A-7, Parcel "A" and Steam Plant	\$ 5,070,000
A-9	\$ 346,000
A-4	\$ 473,000
A-3, Z-12 Tank Farm	\$ 3,844,000
A-2, "F" Water Injectin Plan	\$ 350,000
A-1, Slurry Processing Facility	\$ 514,000
G-1	\$ 250,000
SUBTOTAL FOR PIER G & H:	\$ 14,854,000
Pier J Tidelands Set-Aside Areas:	
Set-Aside Area Name	SUBTOTAL ESTIMATE
Pier J Facilities C	\$ 115,000
J-1	\$ 113,000
J-3	\$ 134,000
J-5	\$ 117,000
J7	\$ 165,000
SUBTOTAL FOR PIER J:	\$ 644,000
SUBTOTAL ESTIMATE	
REMEDATION ESTIMATE SUBTOTAL FOR TIDELANDS SET-ASIDE AREAS:	\$ 35,527,000

EXHIBIT B

Full Field Abandonment Opinion of Probable Cost

September 2017



Summary

- Cost Summary
- Qualifications
- Scope
- Basis of Estimate
- Facility & Pipeline Location Maps
 - THUMS
 - Tidelands

Cost Summary – LBU

Category	2016 Estimate	Updated Estimate	Updated Estimate (Escalated to 2040)
Pipelines and Facilities	\$140MM	\$230MM	\$410MM
Remediation	\$50MM	\$30MM	\$70MM
Well Abandonment	\$280MM	\$370MM	\$630MM
Total	\$470MM	\$630MM	\$1,480MM

Island Removal 2-Islands (Option 1 - Off-Shore Disposal)	\$260MM	\$80MM	160MM
Island Removal (Option 2 - On-Shore Disposal)		\$210MM	\$400MM

Cost Summary – Tidelands

Category	2016 Estimate	Updated Estimate	Updated Estimate (Escalated to 2040)
Pipelines and Facilities	\$50MM	\$130MM	\$250MM
Remediation	\$10MM	\$40MM	\$70MM
Well Abandonment	\$220MM	\$230MM	\$400MM
Total	\$280MM	\$400MM	\$750MM

Qualifications

Cost estimate excludes:

- Removal of existing Pier D THUMS Power Plant
- Re-abandonment of abandoned wells
- Business disruption cost for terminals, tenants, adjacent businesses, etc.
- Accessibility due to future development
- Accelerated schedules
- Facility expansion or contraction

Qualifications

Cost estimate excludes:

- Coastal Commission approval or interface
- Future regulatory or environmental changes
- Maintenance costs
 - Operations revenue will cover maintenance costs until the field is uneconomic
 - After cessation of operations, no further maintenance is expected

Cost Estimate Team

- SPEC Services, Inc. Pipelines and Facilities Removal
- Moffatt & Nichol Island Land Mass Removal
- Geosyntec Remediation
- CRC (In-House) Well Abandonment

Scope of Cost Estimate

- Abandonment of active & idle wells (over 2,400)
- Removal of THUMS and Tidelands facilities:
 - (30) Tidelands set-aside and operating areas
 - (9) THUMS off-shore and on-shore operating areas
 - (3) Water pumping plants
 - (4) Tank Farms
 - (1) Gas processing plant
 - Maintenance yards, slurry plant
 - Removal or abandon-in-place of pipeline network
- Removal of two (2) THUMS island land masses.
- Soil remediation included.

Basis of Estimate - General

- Contingency is included at 30%
- Union wage rates considered in the estimate
- Construction management factored at 5%
- Owner overhead included at 10% before contingency
- Escalation at 2.8% extrapolated to year 2040

Basis of Estimate – Pipelines and Facilities

- Detailed estimates developed for representative sites
- Estimates extrapolated for similar facilities based on site area, well count and facility type.
- Based on pipeline locations and accessibility, a portion of the lines will be removed with the remainder abandoned in place.

Basis of Estimate – Island Removal

- Estimate includes only removal of two (2) islands.
- Detailed estimate developed for removal of one island
- Estimate extrapolated for 2nd island based on area.
- Two disposal options are presented: off-shore or on-shore
- Estimate assumes 2% of soil is contaminated

Basis of Estimate – Remediation

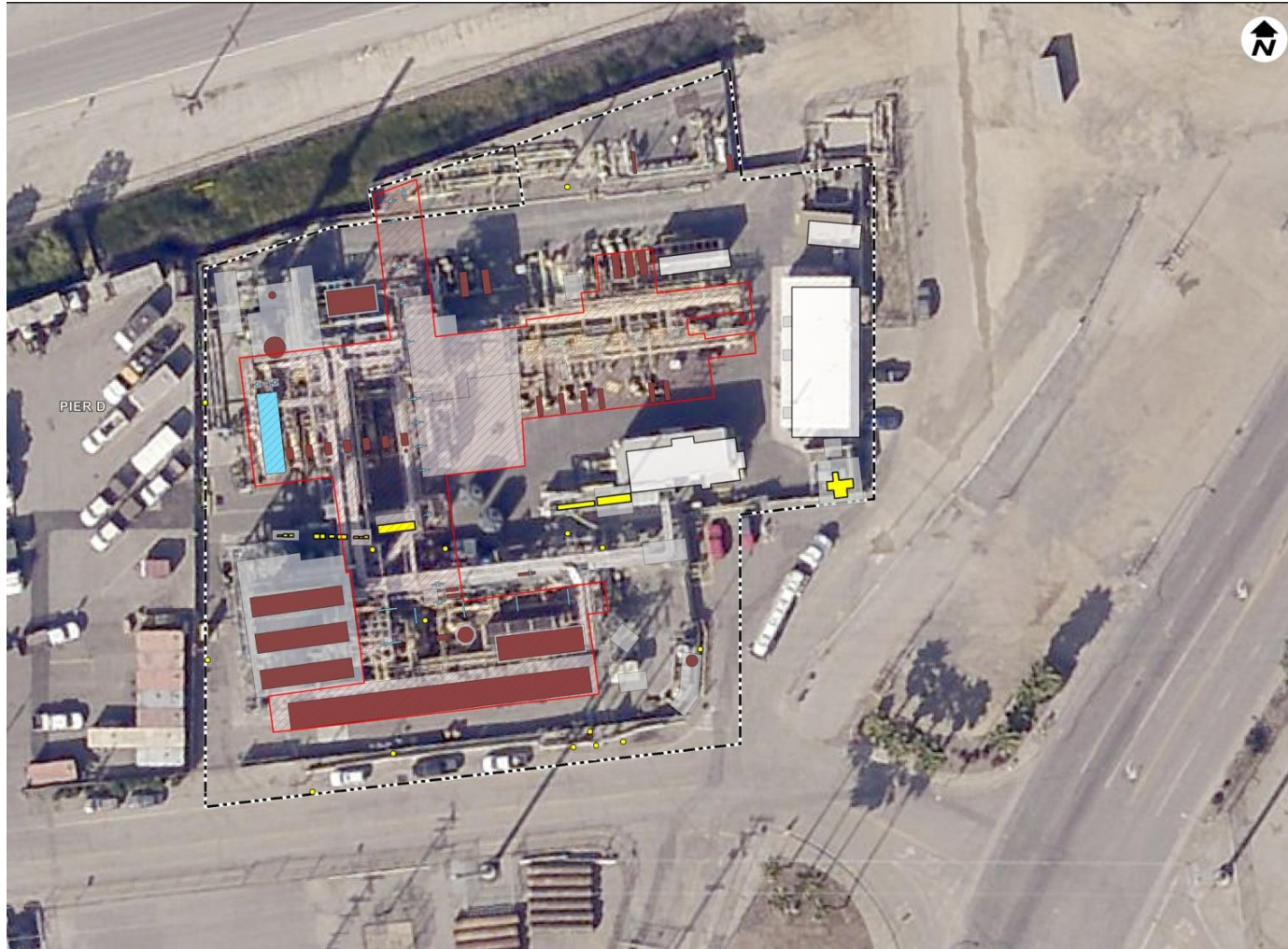
- Volumes were determined by a high-level review of site history.
- Soil removal depth is limited to a maximum of five (5) feet
- No remediation investigation/testing was conducted.

Basis of Estimate – Wells

- Well abandonment costs are based on recent historical data.
- Well count includes current active and idle wells.
- Wells will be abandoned to current DOGGR requirements.
- Removal of conductor and casing for island wells to 5 feet below mud line is only included in island removal case

THUMS Facilities & Pipelines

B&M Gas Plant



THUMS Facilities & Pipelines

Pier J On-Shore Facility (Estimate Base Line)



THUMS Facilities & Pipelines

Island White (Estimate Base Line) (one of four off-shore operating areas)



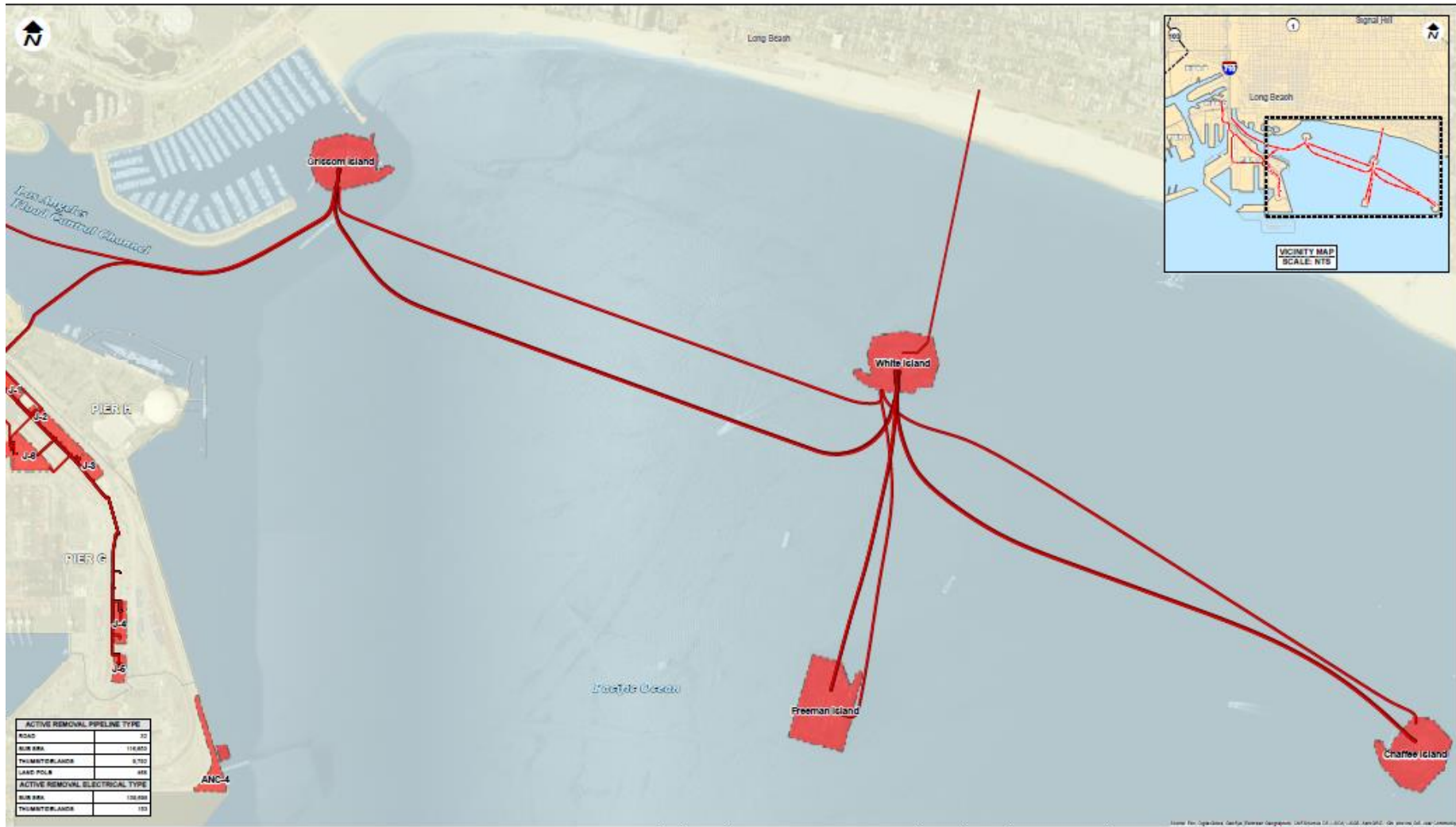
THUMS Facilities & Pipelines

THUMS Pipelines (1 of 2)



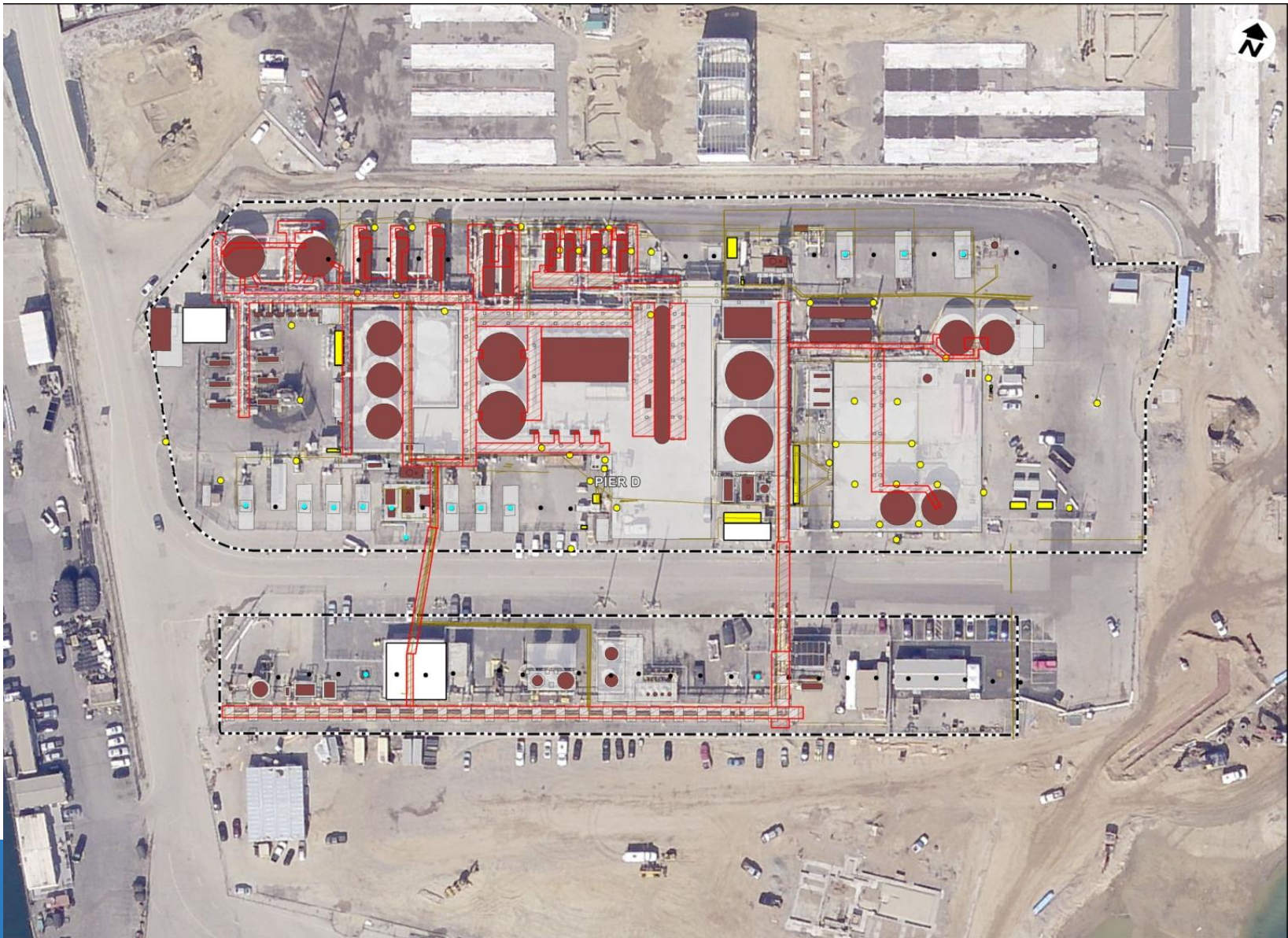
THUMS Facilities & Pipelines

THUMS Pipelines (2 of 2)



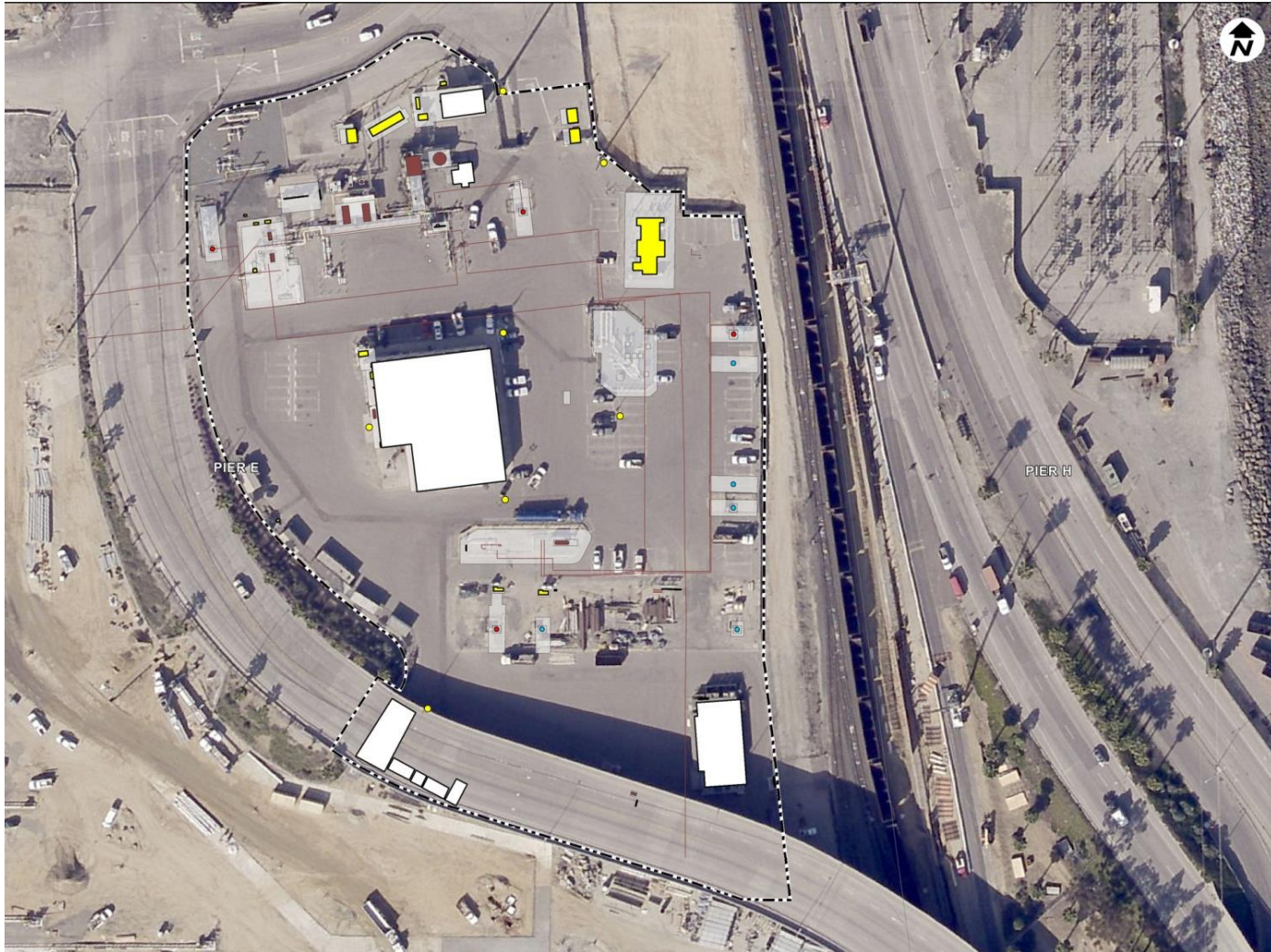
Tidelands Facilities & Pipelines

X & Y Tank Farm (Estimate Base Line) (Similar to other 3 tank farms)



Tidelands Facilities & Pipelines

Z Water Plant (Pumping) / Walker Center (Est. Base Line) (Office, Whse.)



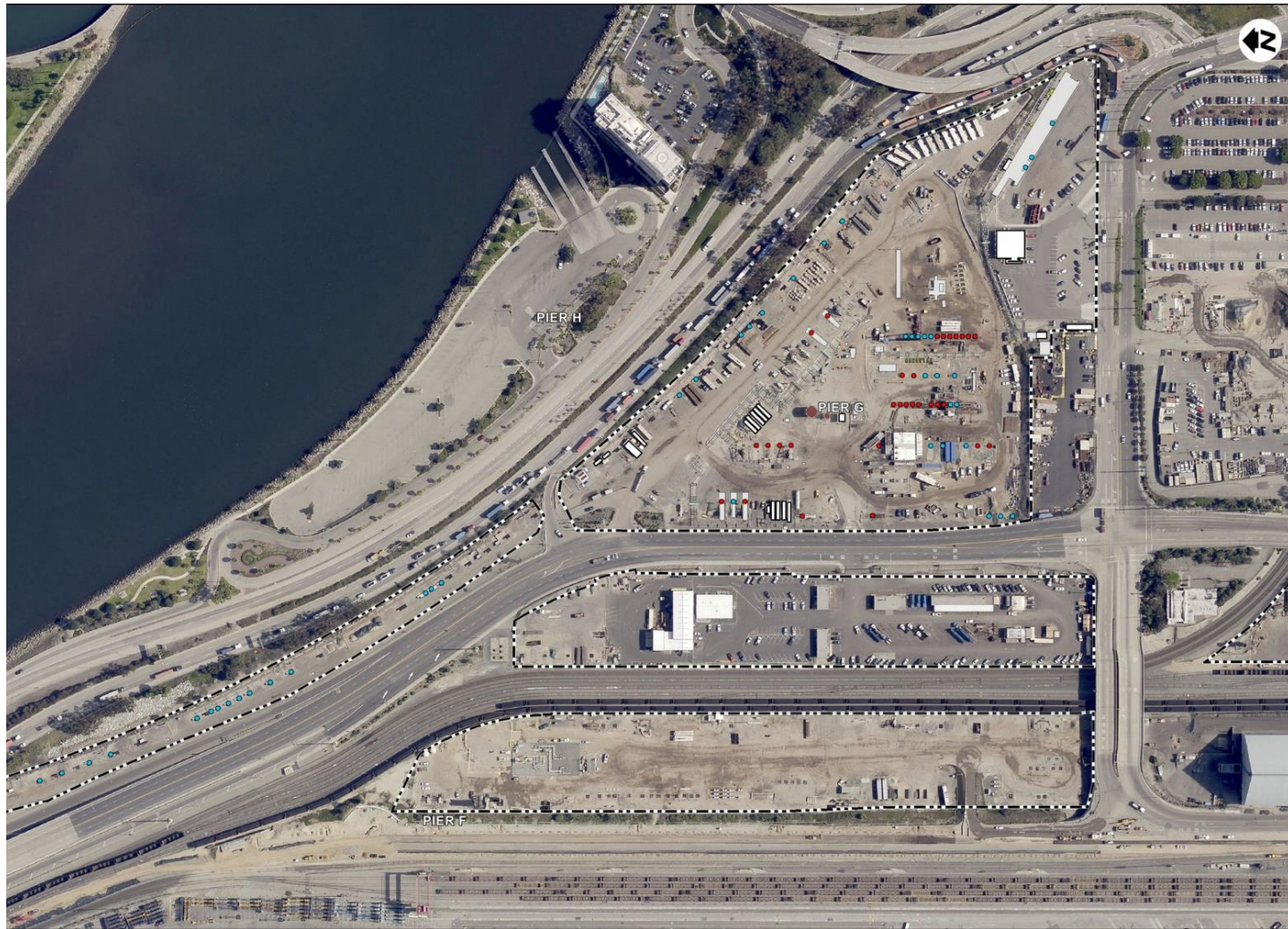
Tidelands Facilities & Pipelines

West of Vopak (Estimate Base Line) (Typical Small Operating Area)



Tidelands Facilities & Pipelines

Parcel A (Estimate Base Line) (Typical Large Operating Area)



Tidelands Facilities & Pipelines

Injection Pipeline System (Example network for one system)





EXHIBIT C

M E M O R A N D U M

Working Together To Serve

Date: October 26, 2017

To: John Gross, Director, Financial Management

From: Bob Dowell, Director, Long Beach Gas and Oil *Bob Dowell*

Subject: **Fiscal Year 2018 Oil Field Abandonment Liability – No Removal of Islands and Powerplant**

The revenues and liabilities from oil operations are accumulated and disbursed among three City funds as shown in the attached table: The Tideland Oil Revenue Fund, the Tidelands Operating Fund, and the Upland Oil Fund. For Fiscal Year 2018, the total abandonment liabilities are estimated to be \$836 million for the Tidelands Trust (State), \$113 million for the Tidelands Operating Fund, and \$21.0 million for the City's proprietary interest (Uplands). Total abandonment liabilities increased by \$34.8 million over last fiscal year as determined by a recent abandonment liability analysis.

As of July 1st, 2017, the remaining unfunded liability for the Tidelands Trust (State) is estimated at \$536 million, \$90.2 million for the Tidelands Operating Fund, and \$14.0 million for the City's proprietary interest based on the respective balances in each reserve for abandonment.

The unfunded liability per barrel has significantly increased for the Tidelands Operating Fund and the City's proprietary interest primarily due to the following reasons:

- i. CRC was tasked by the City to conduct a study to provide a best estimate for facilities abandonment costs. The analysis indicated that the Tidelands operating area would require additional costs to abandon than previously estimated.
- ii. The production forecast has continued to decline due to very few new wells drilled over the last fiscal year as a result of the low oil price environment.

The decrease in drilling investment was made in an effort to maximize oil profits in a continuing low oil price environment. For the City's proprietary interest, the unfunded liability is \$8.78 per barrel of oil forecast to be produced through Fiscal Year 2035. While the oil price determines the ultimate field life, currently the field contractor has reported end of field life of 2041 and 2030 for Long Beach Unit and Tidelands, respectively, for Year End 2016 SEC filing. In this analysis, end of field life of 2035 was used for each abandonment fund.

The base goal for abandonment reserve in FY 18 is \$5 million for Tidelands Operating Fund and \$660,000 for Uplands. The City will consider increasing its savings for abandonment this fiscal year if oil prices allow for profits more than the current budget forecast.

If you have questions or require additional information, please contact Kevin Tougas at 562-570-3963.

Attachment

cc: David Nakamoto, Financial Management
Marina Voskanian, State Lands Commission
Cameron Smith, Long Beach Gas & Oil

ABANDONMENT LIABILITY CALCULATION	Well ABD Liability (x \$1,000)	Facilities and Soil ABD Liability (x \$1,000)	Total ABD Liability (x \$1,000)	Current Reserve for ABDs (x \$1,000)	Unfunded Liability (x \$1,000)	Production Forecast thru FY2035 (x 1,000 BBLs)	Unfunded Liability per BBL (\$/BBL)
Tidelands Oil Revenue Fund (NX420)^a ("CITY TIDELANDS TRUST")							
October 1, 2017	502,300	333,900	836,200	300,000	536,200	97,840	5.480
October 1, 2016	373,000	464,500	837,500	300,000	537,500	109,220	4.921
Change from 2016	129,300	-130,600	-1,300	0	-1,300	-11,380	0.559
Tidelands Operating Fund (TF 401)							
October 1, 2017	73,900	38,800	112,700	22,463	90,237	8,300	10.872
October 1, 2016	64,200	19,400	83,600	17,438	66,162	8,590	7.702
Change from 2016	9,700	19,400	29,100	5,025	24,075	-290	3.170
Upland Oil Fund (SR134) ("CITY PROPRIETARY")							
October 1, 2017	12,130	8,850	20,980	7,012	13,968	1,590	8.785
October 1, 2016	10,220	3,780	14,000	6,199	7,801	1,730	4.509
Change from 2016	1,910	5,070	6,980	813	6,167	-140	4.276
TOTAL							
October 1, 2017	588,330	381,550	969,880	329,475	640,405	107,730	5.945
October 1, 2016	447,420	487,680	935,100	323,637	611,463	119,540	5.115
Change from 2016	140,910	-106,130	34,780	5,838	28,942	-11,810	0.829

^aExcludes Long Beach Unit Tract 2

APPENDIX D

Date: December 9, 2022

To: Thomas B. Modica, City Manager



From: Kevin Riper, Director of Financial Management



For: Mayor and Members of the City Council

Subject: **Revenue Implications of SB 1137 - Health and Safety Setbacks Around New and Reworked Existing Oil Wells**

Recently enacted Senate Bill (SB) 1137 establishes a 3,200-foot health and safety zone around new and reworked existing oil wells and prohibits drilling of new wells and improvements to existing wells within that radius. The legislation was introduced in the final two weeks of the session as a gut-and-amend, and it passed with very little opportunity to engage in the development of the proposal. The City of Long Beach (City) sent a [letter](#) to the authors and to Governor Newsom outlining the concerns and potential impacts of the legislation on the City's actions to safely manage the environmental risk of subsidence; reserve funding for oil well abandonment; and funding a variety of climate, health, and youth programs in Long Beach.

Despite the truncated legislative process at the very end of the session, this legislation will have significant ramifications for oil operations throughout the state. In Long Beach, the City was already in the process of planning a transition away from oil production as early as 2035, but the legislation will greatly expedite this transition. While the City fully supports the intent of the legislation to advance health equity and mitigate the impacts of climate change—and Long Beach has been a leader in this field—SB 1137 presents major fiscal challenges for the City's efforts to fund oil well abandonment, as well as critical local programs and projects in the Tidelands.

The Energy Resources Department and the State's Geologic Energy Management Division (CalGEM) estimate that the legislation's required 1.15-square-mile health and safety setbacks will apply to about half of the City's oil wells, and accelerate the elimination of oil production before the previously projected year, which was 2035. This impact is due to a projected doubling of the rate of annual decline in oil production in the City. Until now, the Energy Resources Department has assumed a long-term, natural decline of 6 percent per year in oil production. Under SB 1137, that decline is assumed to double, to 12 percent per year.

SB 1137 is slated to go into effect January 1, 2023. However, the effective date of SB 1137 is uncertain due to an initiative petition drive by the oil industry to place a Statewide proposition before the voters in March 2024 that would overturn SB 1137. If SB 1137 ultimately stands, it will significantly reduce revenue in the City's Tideland Operating Fund; and cause smaller revenue reductions in the Uplands Oil Revenue Fund, which is part of the General Fund Group; and elsewhere in the General Fund, beginning in the second year that SB 1137 is in effect.

A October 25, 2021 [memorandum](#) from the Energy Resources and Financial Management Departments foreshadowed this possibility, accurately predicting that, "Any actions by the State

to reduce or stop oil production before 2035 may also have an additional adverse impact on City oil production over time and may result in less time to adjust to lower oil revenue....”

Estimated Tideland Operating Fund Impacts

The price of Wilmington Crude oil produced in Long Beach has averaged about \$70 per barrel (bbl) over the last 17 years, so the Energy Resources Department has evaluated the revenue impacts of SB 1137 on the Tideland Operating Fund under two different future oil-price scenarios: (i) the City’s usual, deliberately conservative assumption of \$55/bbl for a commodity famous for wild swings in price; and (ii) a \$65/bbl assumption that is closer to historical actuals.

The tables below show the resulting revenue reductions for the Tideland Operating Fund, in millions of dollars, with parentheses denoting a revenue loss after SB 1137, compared to revenue before SB 1137.

<u>Oil price/bbl</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>
\$55	-0-	(\$9.9m)	(\$11.1m)	(\$12.9m)	(\$13.9m)	(\$13.6m)
OR						
\$65	-0-	(\$6.1m)	(\$7.8m)	(\$9.9m)	(\$11.7m)	(\$13.1m)

Under either oil-price assumption, the financial implications of the projected loss in revenue to the Tideland Operating Fund are obvious: (i) less money to spend on annual operating expenses in the Tidelands; and/or (ii) less money available to pay debt service on the long-term municipal bonds that would need to be sold to finance capital projects in the Tidelands, such as the Belmont Beach and Aquatic Center, structural improvements to the Convention and Entertainment Center, and water circulation pumps for Alamitos Bay.

Estimated Uplands Oil Revenue Fund (part of the General Fund Group) Impacts

<u>Oil price/bbl</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>
\$55	-0-	(\$0.9m)	(\$1.6m)	(\$2.1m)	(\$2.6m)	(\$2.9m)
OR						
\$65	-0-	(\$0.5m)	(\$1.2m)	(\$1.8m)	(\$2.3m)	(\$2.7m)

Estimated General Fund (other than Uplands Oil Revenue Fund) Impacts

The General Fund receives revenue related to the production of oil in several other ways.

Sales and Use Tax (Bradley-Burns 1 percent) and Transactions and Use Tax (Measure A 1 percent): several sales tax generators in the City are involved in oil production. To the extent that SB 1137 reduces the production of oil, sales in Long Beach will be reduced, and so will the sales taxes paid. Other sales tax generators in the City sell petroleum-based products at retail, and to the extent that SB 1137’s reduction in locally produced oil also affects those firms, their sales in Long Beach will similarly be reduced, and so will the sales taxes they generate. Both factors are included in the revenue estimates for sales tax loss on the next page.

Property Tax: Oil production companies pay property taxes on the assessed value of their land and improvements (structures, equipment). To the extent that SB 1137 eventually reduces the market value of their property below the assessed value, the City -- and all other taxing jurisdictions -- will receive less property tax revenue from oil production companies than currently received. However, at least for those oil production properties that have remained under the same ownership, 40-plus years of Proposition 13 being in effect almost certainly means that today's market value of oil-production properties is much higher than today's assessed value on which property tax bills are calculated. Therefore, it is likely that these oil-production properties have a long way to fall in market value before their property tax bills actually go down, and thus before the City -- and all other taxing jurisdictions -- experience any loss in property tax revenue. As a result, the table below assumes zero reduction in property tax revenue over the forecast horizon. Eventually, the value of the oil-production properties will drop as oil is no longer able to be extracted from them, at which time the property tax revenue they generate will drop sharply. That is likely to occur beyond the timeframe of this analysis.

Utility Users Tax: Oil production companies use substantial amounts of electricity, which generates utility users tax revenue for the City. To the extent that SB 1137 causes them to produce less oil, they will use less electricity, which will reduce utility users tax revenue.

Measure US and Prop H Oil Barrel Production Tax: City revenue generated from the business license tax on oil production depends on the number of barrels of oil produced. As SB 1137 restricts oil production, revenue from Measure US and Prop H will decrease.

The table below lists General Fund revenue loss projections by the Energy Resources Department (utility users tax and Measure US/Prop H business license tax) and the Financial Management Department (sales tax and property tax). These projections are less sensitive to the assumed price of oil than the other revenue estimates shown above. Therefore, these projections are all based on an oil-price assumption of \$55/bbl.

<u>Rev. Source</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>
Sales tax	-0-	(\$0.7m)	(\$0.9m)	(\$1.2m)	(\$1.2m)	(\$1.2m)
Property tax	-0-	-0-	-0-	-0-	-0-	-0-
Util users tax	-0-	(\$0.3m)	(\$0.5m)	(\$0.7m)	(\$1.0m)	(\$1.2m)
<u>Measure US</u>	<u>-0-</u>	<u>(\$0.3m)</u>	<u>(\$0.3m)</u>	<u>(\$0.2m)</u>	<u>(\$0.2m)</u>	<u>(\$0.2m)</u>
Subtotal	-0-	(\$1.3m)	(\$1.7m)	(\$2.1m)	(\$2.4m)	(\$2.6m)
<i>Add: Uplands</i>						
<u>Rev. Fund</u>	<u>-0-</u>	<u>(\$0.9m)</u>	<u>(\$1.6m)</u>	<u>(\$2.1m)</u>	<u>(\$2.6m)</u>	<u>(\$2.9m)</u>
Total, General Fund	-0-	(\$2.2m)	(\$3.3m)	(\$4.2m)	(\$5.0m)	(\$5.5m)

The revenue loss projections for both the Tideland Operating Fund and the General Fund are subject to many assumptions, and actual results could well differ noticeably from these estimates.

Oil Well Abandonment Costs

The total cost to abandon, eventually, the City's oil wells is currently estimated at \$1.2 billion, allocated to the various owners as follows:

State	\$ 939.7 million
City	\$ 154.0 million
Townlot	\$ 68.7 million
<u>CRC</u>	<u>\$ 61.4 million</u>
TOTAL	\$ 1,223.8 million

Existing reserves for those oil abandonment costs are as follows:

State	\$ 300.0 million, or 32 percent of State's liability
City	\$ 70.0 million, or 45 percent of City's liability
Townlot	\$ unknown, but assume zero
<u>CRC</u>	<u>\$ 61.4 million bond, or 100 percent of CRC's liability</u>
TOTAL	\$ 431.4 million, or 35 percent of total liability

Therefore, the City still needs to set aside an additional \$84 million to fully fund its own oil well abandonment liability. At the previously projected abandonment liability reserve of \$8.75 million per year (consisting of \$7.125 million in the Tideland Operating Fund plus \$1.625 million in the Uplands Oil Revenue Fund), it would take another 10 years to fully fund the City's liability. As the oil revenue continues to decline, the abandonment reserve will become a larger percentage of the total oil revenue.

Under SB 1137, with Tideland and Uplands revenue losses of more than \$15 million annually by Year 4, there will not be enough remaining revenue to support current operating expenses, existing and planned debt service on Tidelands municipal bonds, and oil-well abandonment liability set asides. It is conceivable that the General Fund may have to plug that liability gap in the late 2020s or early 2030s.

Total Financial Impact (Tidelands Fund and General Fund)

For just the first five years affected by SB 1137 as shown above, the total revenue loss to the City is projected at \$81.6 million assuming \$55/bbl oil price, or \$67.2 million assuming \$65/bbl. Add to that the City's remaining unfunded liability for oil well abandonment costs at the end of those five years (\$40.25 million) for which the historical revenue source will be literally drying up, and the total negative financial impact of SB 1137 on the City over just the first five years is estimated at \$122 million (\$55/bbl assumption), or \$107 million (\$65/bbl assumption).

Revenue Implications of SB 1137 - Health and Safety Setbacks Around New and Reworked Existing Oil Wells
December 9, 2022
Page 5

If you have any questions, please do not hesitate to contact Kevin Riper at (562) 570-6427 or Kevin.Riper@longbeach.gov.

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