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Improving the Effectiveness of Geological and Technical Measures and Optimizing Development of The UMID Oil Gas Condensate Field

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Abstract: This study evaluates geological and technical measures at Uzbekistan's Umid oil–gas–condensate field using retrospective dissertation data. The effective oil-saturated thickness is 6.7 m. Reported concurrent oil and gas-condensate development was associated with annual oil production increasing from 14.8 to 59.0 thousand tonnes. After treatment, reported gas rates rose by 20 and 45 thousand m^3/d in wells 78 and 12 and oil production by 0.5 t/d in well 77. High water cut and limited oil-well availability constrain performance. Coordinated gas withdrawal, well-specific interventions, and gas-lift assessment are priorities; sustained recovery and economic benefits remain unverified.

Keywords: Umid field; oil rim; gas cap; well intervention; gas lift; water cut; reservoir management.

Introduction:

The Umid field in Uzbekistan's Mirishkor district, Kashkadarya region, contains an Upper Jurassic carbonate reservoir with a thin oil rim between a large gas cap and formation water. Development must balance liquid-hydrocarbon recovery against gas withdrawal and unwanted water entry (Sultanova, 2026). This study evaluates reported interventions, production shortfalls, and development strategies to identify operational priorities. It synthesizes existing field evidence without claiming a numerical optimum or a controlled assessment of treatment effectiveness.

METHODS

The primary source is the author's 2026 master's dissertation (Sultanova, 2026), including geological descriptions, the 2001, 2005, and 2010 development plans, production comparisons, and well-intervention records. Tables 1 and 2 reproduce its reservoir parameters and treatment outcomes. The analysis compares development objectives, planned and actual output, and production rates before and after treatment.

Exploratory well 1 yielded gas at approximately 2,570 m, oil and gas condensate at 2,620–2,630 m, and water-bearing gas at 2,640–2,645 m (Sultanova, 2026). This close vertical proximity helps explain the challenge of controlling unwanted fluid entry into the oil-producing interval.

Table 1 Reservoir and fluid characteristics of the Umid field

Parameter	Unit	Reported value
Average reservoir depth	m	2,619
Average oil-saturated thickness	m	9.9
Effective oil-saturated thickness	m	6.7
Average gas-saturated thickness	m	67.5
Average porosity	%	13.0
Initial reservoir pressure	MPa	27.6
Reservoir temperature	°C	100.2
Oil density at standard conditions	kg/m³	891

Source: Sultanova (2026), Table 3.2, p. 60. The source's "average reduced" thicknesses are shown as averages; effective oil thickness is retained separately. Ambiguous area, permeability, and viscosity entries are excluded.

Treatment response equals the post-treatment rate minus the pre-treatment rate; percentage change uses the pre-treatment rate as denominator. Production shortfall equals planned minus actual output; its percentage uses planned output. These descriptive comparisons do not isolate causal effects or establish economic performance.

The annual production comparison is labelled both 2013 and 2023 in the source and is therefore retained without a definitive year. Historical forecasts are distinguished from measured performance. Overlapping well-status categories are not summed, and blank product entries are treated as unreported, not zero.

RESULTS

The 2001, 2005, and 2010 plans envisaged five, 38, and 18 oil wells and nine, nine, and 19 gas wells, respectively. Their forecasts cover different periods and cannot be compared directly as achieved efficiency. Following reported concurrent development, annual oil production increased from 14.8 to 59.0 thousand tonnes and condensate from 30.5 to 49.5 thousand tonnes, approximately fourfold and 1.62-fold. Increasing water production after 2007 limits conclusions about sustained effectiveness (Sultanova, 2026).

The 2001 project's Variant I projected 123 thousand tonnes of oil, 9,100 million m³ of gas, and 306.4 thousand tonnes of condensate for 2001–2026, plus 51.99 million m³ of associated gas. The 2005 revision's Variant II envisaged 1,167.8 thousand tonnes of oil, 16,172 million m³ of gas, and 395.05 thousand tonnes of condensate for 2005–2020. The 2010 project's Variant VI forecast 985 thousand tonnes of oil, 15,858.8 million m³ of gas, and 610 thousand tonnes of condensate for 2010–2026 (Sultanova, 2026). These are planning assumptions rather than measured production, and their different periods and well populations preclude attributing differences in totals solely to strategy.

A reported inventory lists 69 wells, including 25 operating wells: six oil and 19 gas wells. Inconsistent dates and overlapping statuses limit interpretation. The reported utilization coefficient fell from 37% in 2016 to 36% in 2019, with unsuccessful returns after workover identified as an operational problem.

Paired treatment records show different responses between wells and products (Table 2). Gas-rate increments in wells 78 and 12 total 65 thousand m³/d, with condensate increments of 2.6 t/d. These sums do not establish a simultaneous field-wide gain.

Table 2 Production rates before and after well treatment

Well	Product and unit	Before	After	Increase	Change (%)
78	Gas, 10^3 m³/d	30	50	20	66.7
78	Condensate, t/d	0.8	1.4	0.6	75.0
77	Oil, t/d	2.5	3.0	0.5	20.0
12	Gas, 10^3 m³/d	40	85	45	112.5
12	Condensate, t/d	1.0	3.0	2.0	200.0

Source: Sultanova (2026), Table 2.1 and narrative, p. 42. Gas units and daily rates follow the narrative; changes are calculated here. Treatment codes are omitted because classifications for well 77 conflict. Test conditions, dates, and response duration are unspecified, preventing annualization or payback estimates.

Planned annual output was 42.000 thousand tonnes of oil, 22.400 thousand tonnes of condensate, and 622.000 million m³ of gas. Actual output was 15.748, 19.269, and 619.894 in the respective units. Shortfalls were 26.252 thousand tonnes of oil (62.5%), 3.131 thousand tonnes of condensate (14.0%), and 2.106 million m³ of gas (0.34%).

Actual water cut was 88.4%, against 79.4% planned, a difference of 9.0 percentage points. Only six oil wells operated against 16 planned. Transfers to gas production and the shutdown of well 23 for workover also contributed to the reported oil deficit (Sultanova, 2026). Gas output near target therefore did not indicate satisfactory liquid-hydrocarbon production.

Well 79 was connected on 22 November 2024 after drilling ended on 31 October. Reported test rates were 4.0 t/d of oil, 41.5 thousand m³/d of gas, and 4.52 m³/d of condensate, with 54% water cut (Sultanova, 2026, Table 2.2). These records reinforce the need to monitor fluid composition from commissioning.

DISCUSSION

The 6.7 m effective oil thickness requires coordinated control of gas-cap withdrawal, reservoir pressure, and water entry. Completion intervals and drawdown should reflect the oil rim, fluid contacts, and low-permeability layers. Preserving viable oil-producing wells is essential because meeting gas targets can coincide with substantial oil shortfalls.

Interventions should be selected using water cut, gas–oil ratio, pressure behaviour, mechanical condition, and previous treatment response. Recoverable flow impairment, water entry, and mechanical failure require different responses. Evaluation should measure stabilized incremental oil or condensate, response duration, water production, downtime, and costs under comparable test conditions.

Gas lift warrants assessment where natural flow has weakened. The dissertation reports gas supply from Umid to North Urtabulak for gas lift and conversion of Umid well 72 to this method. However, attributable production gains, gas consumption, and compression costs are not quantified. Selection therefore requires evaluation of well deliverability, available gas pressure and volume, water handling, and the opportunity cost of lift gas (Sultanova, 2026).

Aggregated historical data, inconsistent dates, and incomplete treatment records constrain interpretation. The source lacks uncertainty ranges, matched untreated wells, and detailed production histories. The findings establish reported rate changes, not causal effects or improved ultimate recovery. Verified primary records, an updated reservoir model, and intervention costs are needed to test the proposed priorities quantitatively.

CONCLUSIONS

Umid’s thin oil rim, high water cut, and limited oil-well availability constrain performance despite reported production increases. Reported post-treatment increases were 20 and 45 thousand m³/d of gas in wells 78 and 12 and 0.5 t/d of oil in well 77. Development priorities are coordinated gas withdrawal, preservation of oil-producing capacity, water control, and well-specific artificial lift. Their effectiveness must be established through sustained product-specific gains, consistent monitoring, and calibrated reservoir and production-system models.

Data availability

Field data are reported in Sultanova’s (2026) master’s dissertation; Tables 1 and 2 identify the underlying sources and unit interpretation.

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