

REFERENCE SCENARIO

Continuous Cadvital Coverage in the Gulf of San Jorge

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Executive Summary

Mature fields in the Gulf of San Jorge operate across thousands of square kilometers and contain hundreds of wells, pumping units, batteries, tanks, flowlines and internal roads.

Most of these assets already benefit from telemetry and remote monitoring. However, telemetry does not eliminate the need to verify what is actually happening in the field. When an anomaly appears, operators still depend on physical inspections to validate events, prioritize interventions and mobilize crews.

This model works.

But it scales imperfectly.

As the covered territory expands, so do inspections, contractors, vehicles, fuel consumption and the time required to understand what is happening in the field.

This document presents an illustrative scenario based on a network of five Cadvital operational nodes deployed across a mature block in the Gulf of San Jorge.

Reference Configuration

Each Cadvital operational node integrates:

- automated drone dock station
- aerial inspection drone
- complementary sensors
- communications
- operational supervision

The scenario adopts five operational nodes because it represents a sufficient scale to capture operational economies and evaluate potential impact across a mature block of meaningful size.

Deployment Assumptions

5 operational nodes

Operational radius: 10 km per node

Coverage area per node: 314 km²

Total coverage area: 1,570 km²

Analysis horizon: 3 years

Covered Assets

Based on densities observed in mature Argentine fields:

- between 200 and 350 wells per node
- between 1,000 and 1,750 wells within the covered perimeter
- pumping units
- batteries, tanks and manifolds
- flowlines and internal roads
- associated electrical infrastructure

Current Operating Model

When an anomaly requires verification, the operator mobilizes personnel and vehicles before deciding on an intervention.

A significant share of field inspections is dedicated to observing, verifying or dismissing events. These activities consume contractors, vehicles, fuel and operational time.

Operating Model with Cadvital Nodes

Operational nodes provide continuous observation and verification across the territory. Telemetry continues to indicate that an anomaly exists. The operational node enables faster determination of what is happening, where it is occurring and whether mobilizing a crew is justified. Crews continue performing maintenance, repair and intervention activities. Routine observation and verification tasks progressively shift to automated infrastructure. Operational nodes complement rather than replace existing procedures. During periods of aerial unavailability caused by weather conditions or maintenance, operators continue relying on their established supervision and verification mechanisms.

Operating Assumptions

Reduction in Time Between Detection and Verification

Working assumption: 50% reduction, to be validated with operational data during the initial deployment phases.

This assumption is consistent with public benchmarks for remote inspection and automated drone operations that demonstrate significant reductions in inspection times and field hours, although no public benchmark currently exists that is directly equivalent to mature fields in the Gulf of San Jorge.

Replacement of Repetitive Inspection Rounds

Operational experience observed in mature Argentine fields indicates that an automated inspection station can assume a significant share of routine activities currently performed through field inspections.

For this scenario, a working assumption equivalent to approximately seven positions dedicated to repetitive inspection rounds per operational node is adopted. This assumption will need to be validated during the initial deployment phases.

Result for 5 operational nodes:

35 equivalent positions

This figure represents repetitive observation and verification activities. It does not include specialized maintenance, production or intervention personnel.

Operational Continuity

Routine inspections can identify precursor conditions before an unplanned shutdown occurs. Recent experience in the Argentine oil industry shows that thermal inspections can detect anomalies in pumping units before a failure occurs, enabling interventions to be scheduled before an unplanned shutdown.

For this scenario, the following conservative assumption is adopted:

- one significant failure avoided every six months

Illustrative Economic Impact

Structural OPEX Reduction

Assumptions:

- 35 equivalent positions

- annual equivalent cost per inspection-round position: USD 35,000 (conservative assumption, subject to validation with actual operational data)

Result:

- potential OPEX reduction: USD 1.23 million per year
- cumulative potential OPEX reduction over 3 years: USD 3.68 million

Operational Continuity

Assumptions:

- one significant failure avoided every six months
- average cost per avoided event: USD 250,000 (conservative assumption, subject to validation with actual operational data)

Result:

- six avoided events over three years
- estimated economic value: USD 1.50 million

Service Cost

The cost estimate includes:

- operational node infrastructure
- drone dock and inspection drone
- non-intrusive sensors and communications
- maintenance and operational supervision

Assumptions:

- USD 7,000 per month per operational node
- 5 operational nodes
- duration: 36 months

Result:

- total service cost: USD 1.26 million

Economic Summary

Item	Estimated Value
Structural OPEX Reduction (3 years)	USD 3.68 million
Operational Continuity (3 years)	USD 1.50 million
Total Estimated Economic Benefit	USD 5.18 million
Total Service Cost	USD 1.26 million
Illustrative ROI	311%
Illustrative Payback Period	8.8 months

The ROI and payback period presented correspond exclusively to the assumptions of this reference scenario and must be validated with actual operational data during the initial deployment phases.

Model Scalability

The economic variables presented in this document correspond to a reference scenario based on five operational nodes.

The table below illustrates how territorial coverage and service costs evolve across different deployment scales.

Operational Nodes	Approximate Coverage	Service Cost (3 years)
2	628 km ²	USD 504,000
5	1,570 km ²	USD 1.26 million
10	3,140 km ²	USD 2.52 million

Economic benefits do not necessarily evolve linearly, as they depend on asset density, existing operational practices and operation-specific economies of scale.

For that reason, ROI and payback periods must be recalculated for each specific deployment.

Additional Non-Quantified Benefits

This scenario does not yet incorporate:

- reduced fuel consumption
- reduced vehicle wear and replacement costs
- reduced road accidents and personnel exposure during field inspections
- potential reduction in the economic impact of unplanned shutdowns through early anomaly detection
- improved territorial coverage
- higher observation frequency of critical assets
- reduced intrusions and vandalism
- accumulation of operational history for predictive maintenance

Conclusion

The primary source of value generated by Cadvital operational nodes does not come from the drone, the dock or the sensors considered individually.

It comes from replacing repetitive field inspections with permanent observation and verification capabilities.

In this reference scenario, a network of five operational nodes significantly expands the effective coverage of remote assets, structurally reduces OPEX and improves operational continuity.

Under the assumptions considered, the scenario delivers an illustrative ROI above 300% and a payback period of less than one year.

As operators extend coverage across increasingly remote assets, continuous observation and verification progressively cease to be a complementary capability and become a central component of the operating model.

About Cadvital

Cadvital develops unmanned observation, inspection and logistics capabilities for remote operations across energy, mining and infrastructure.

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