Executive Report

Mining Laboratory Performance Assessment

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Date: May 2026 vs. January–April 2026 YTD

Contents

Executive Summary

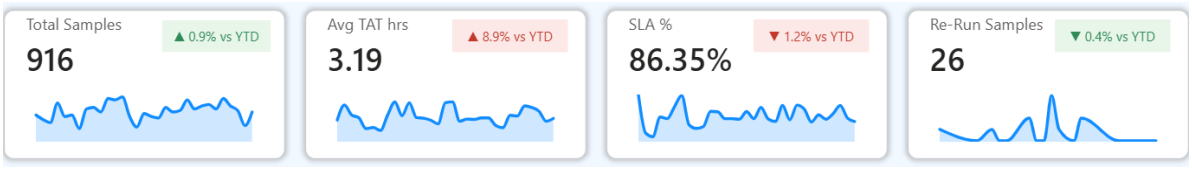

Figure 1: Executive KPI dashboard summary for May 2026.

In May 2026, the laboratory received **916 samples**, compared with a normalized January–April YTD expectation of **908.04 samples**. This represents a modest **0.88% increase**, indicating that May workload was broadly consistent with the prior YTD operating rate.

Despite stable demand, performance weakened. Average turnaround increased from **2.93 hours** to **3.19 hours**, an **8.88% increase**. SLA compliance declined from **87.37%** to **86.35%**, a decrease of **1.01 percentage points**. Late samples increased from a normalized expectation of **114.70** to **125**, an increase of **8.98%**.

Executive finding: May performance degradation appears to be driven by localized throughput pressure, especially in XRF-supported Smelter workflows. The decline was not caused by higher total volume, increased rush demand, or increased re-run volume.

Re-run volume and rush volume were effectively flat. May re-run samples totaled **26**, compared with a normalized YTD expectation of **26.09**. Rush samples totaled **110**, compared with a normalized expectation of **110.57**. This makes a demand-mix explanation less likely.

What Changed in May

KPI	May	YTD Comp.	Delta	Interpretation
Samples	916	908.04	+0.88%	Volume was essentially flat.
Avg Turnaround	3.19 hrs	2.93 hrs	+8.88%	Processing slowed materially.
SLA Compliance	86.35%	87.37%	-1.01 pp	Service performance declined.
Late Samples	125	114.70	+8.98%	More samples missed SLA than expected.
Re-Run Samples	26	26.09	-0.35%	Rework volume was flat.
Rush Samples	110	110.57	-0.51%	Rush demand was flat.
Avg Lateness	1.90 hrs	1.98 hrs	-3.95%	Late samples were slightly less severe.
Max Lateness	11.98 hrs	24.08 hrs	-50.25%	Worst-case lateness improved substantially.

Table 1: High-level KPI summary for May 2026 against normalized January–April YTD baseline.

The most important operational nuance is that May had **more late samples**, but those late samples were **not more severe**. Average lateness improved from **1.98 hours** to **1.90 hours**, median lateness improved from **1.25 hours** to **1.23 hours**, and maximum lateness improved from **24.08 hours** to **11.98 hours**.

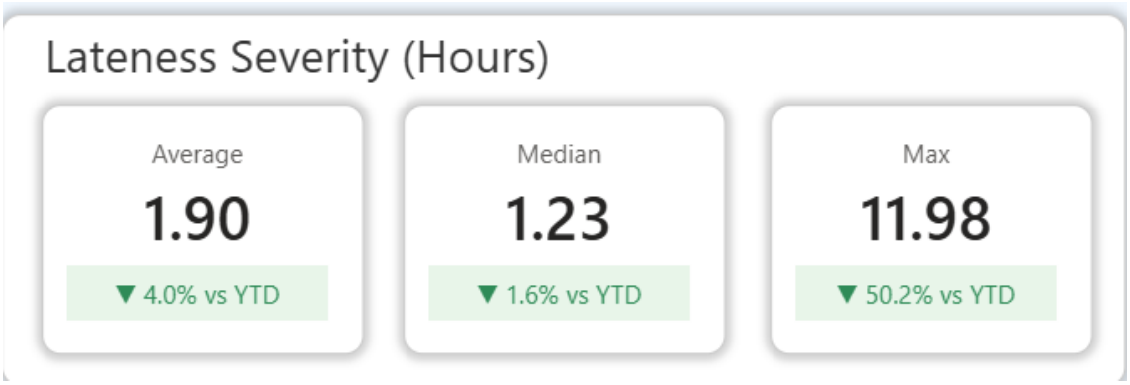

Figure 2: Lateness severity indicators for May 2026.

This pattern suggests workflow congestion near SLA thresholds rather than catastrophic operational failure. The lab missed SLA slightly more often, but not by larger margins.

Primary Finding: XRF-Supported Workflows Are the Main Bottleneck Signal

The strongest evidence points to localized throughput pressure in XRF-supported workflows. XRF-1 and XRF-2 handled approximately **62%** of total May volume and both experienced double-digit increases in average turnaround.

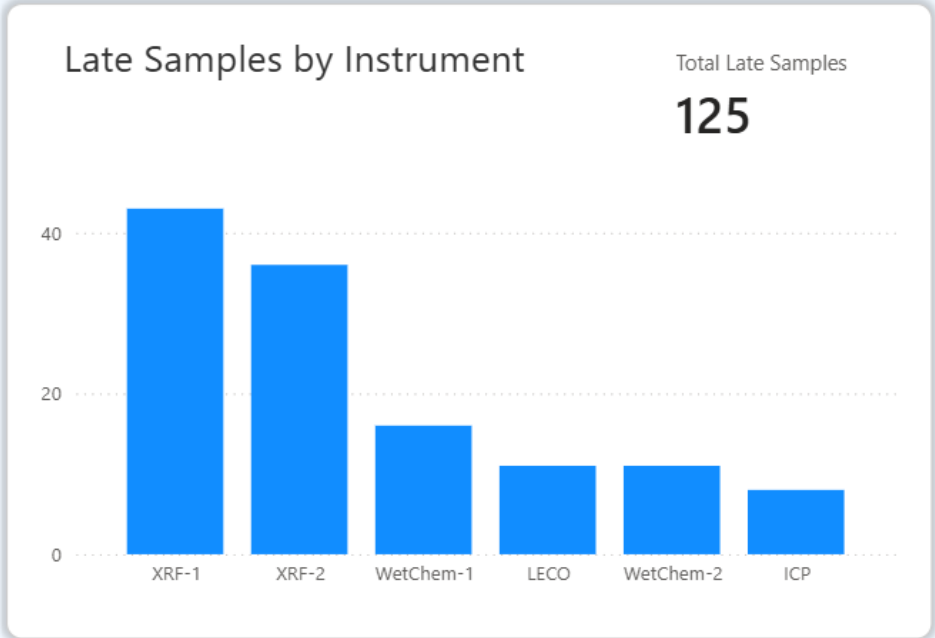

Figure 3: Late samples by Instrument for May 2026.

Instrument	Samples	Share	Avg TAT	TAT Delta	SLA Delta
XRF-1	318	34.72%	3.46	+15.50%	-0.48 pp
XRF-2	254	27.73%	3.17	+14.20%	-1.06 pp
WetChem-1	107	11.68%	3.17	+8.07%	-5.13 pp
WetChem-2	72	7.86%	3.47	+9.04%	0.00 pp
LECO	91	9.93%	2.64	-16.07%	-0.48 pp
ICP	74	8.08%	2.50	-6.18%	+1.06 pp

Table 2: Instrument-level performance highlights.

The instrument-level pattern matters because XRF-1 and XRF-2 combine high volume with worsening turnaround. XRF-1 processed **318 samples**, representing **34.72%** of May volume, while XRF-2 processed **254 samples**, representing **27.73%**. XRF-1 average turnaround increased by **15.50%**, and XRF-2 average turnaround increased by **14.20%**.

Primary operational hypothesis: The May slowdown was most likely driven by throughput pressure in XRF-supported workflows. This should be validated against maintenance logs, calibration records, queue timing, and staffing coverage.

WetChem-1 should be treated as a secondary concern. It had the largest instrument-level SLA decline at **-5.13 percentage points**, but it represented a much smaller share of total May volume than the combined XRF workflow.

Primary Finding: Smelter Concentration Amplified the Impact

The **Smelter department** is the main system-level driver. It handled **530 samples**, representing **57.86%** of May volume. Average turnaround increased by **12.34%**, SLA compliance declined by **2.89 percentage points**, and late samples increased by **24.48%** against normalized YTD expectations.

This is important because the Smelter department carries enough volume that even moderate performance degradation can materially affect total lab results. In contrast, the Environmental department had the sharpest department-level turnaround deterioration at **35.24%**, but represented only **7.75%** of May volume. Environmental should be reviewed, but it is less likely to be the primary driver of the total May decline.

Department-level conclusion: Smelter explains the broad performance pressure. Environmental explains a localized process concern.

Secondary Findings Worth Management Attention

Routine Samples Drove Most Late Work by Volume

Routine samples dominated the workload, with **635 samples** and **69.32%** of total May volume. Routine volume was almost exactly equal to normalized YTD expectations, but late samples increased by **12.73%** and SLA compliance declined by **1.47 percentage points**.

This matters because Routine samples are the operational baseline of the lab. Even modest deterioration in this category can create visible movement in overall SLA performance.

Environmental SLA Deterioration Requires Targeted Review

Environmental performance showed several warning signs. The Environmental area had the weakest area-level SLA compliance at **78.95%**, down **7.88 percentage points**. Environmental sample type volume also increased materially, with **38 May samples** against a normalized YTD expectation of **25.06**, a **51.65% increase**. Late samples for Environmental sample type increased by **125.81%**.

This is not the largest total-volume driver, but it is one of the clearest targeted investigation signals.

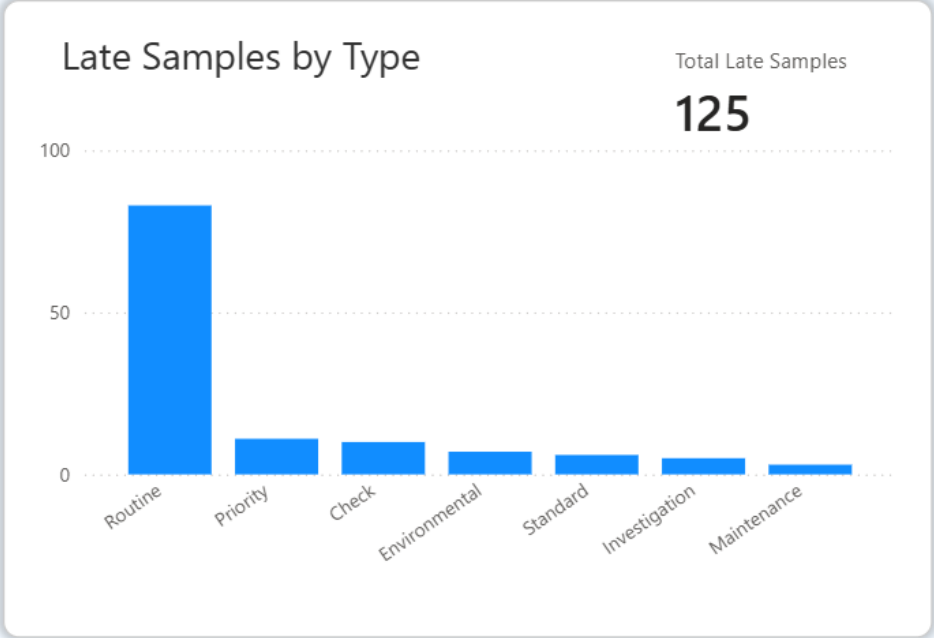

Figure 4: Late samples by sample type for May 2026.

Maintenance and Tailings Should Be Monitored, Not Overinterpreted

Maintenance samples had the lowest sample-type SLA compliance at **70.00%**, but this was based on only **10 samples**. Tailings also showed a sharp area-level SLA decline of **-9.49 percentage points** and a re-run rate increase of **6.27 percentage points**, but May Tailings volume was only **44 samples**.

These categories should be monitored, but they should not dominate the executive interpretation unless the trend continues.

Technician-Level Results Require Assignment Context

Technician-level findings should not be interpreted as individual performance conclusions without reviewing instrument assignment, sample mix, shift coverage, and workload complexity.

The strongest technician-level signal was **R. Johnson**, whose average turnaround increased **30.02%**, SLA declined **3.72 percentage points**, and late samples increased **29.03%**. **A. Garcia** handled the highest technician volume at **152 samples**; average turnaround increased **20.69%**, but SLA improved **1.04 percentage points**. This suggests workload mix and assignment patterns may matter more than individual productivity alone.

Technician interpretation rule: Review technician results in the context of assignment patterns and operational constraints. Avoid treating technician KPIs as individual blame metrics without further validation.

Root Cause Synthesis

Confirmed Facts from the Data

- May total volume was essentially flat against normalized YTD expectations.
- Rush volume was flat.
- Re-run volume was flat.
- Average turnaround increased materially.
- SLA compliance declined slightly.
- Late sample count increased.
- Late sample severity improved.
- XRF-1 and XRF-2 handled approximately 62% of May volume and both slowed by double digits.
- Smelter handled nearly 58% of May volume and degraded across turnaround, SLA compliance, and late sample count.

Likely Operational Explanation

The most likely explanation is **localized capacity or workflow congestion**, especially around XRF-supported workflows. XRF-1 and XRF-2 carried the majority of lab volume and both slowed significantly. Since overall volume, rush rate, and re-run volume were flat, the problem likely came from throughput efficiency rather than demand shock.

The evidence points toward a throughput constraint, not a demand spike. The leading hypothesis is that XRF-supported workflows experienced operational congestion during May 2026.

Items Requiring Client Validation

The data suggests XRF bottleneck risk, but it does not prove the physical cause. A real client should validate:

- XRF maintenance logs.
- Calibration and drift records.
- Operator assignment schedules.
- Shift coverage.
- Queue and backlog timing.

- Sample routing rules.
- Whether key technicians were disproportionately assigned to XRF or high-complexity samples.

Operational Risks

1. **XRF bottleneck risk.** XRF-1 and XRF-2 both slowed while handling approximately 62% of May volume. If this continues, SLA compliance may deteriorate further.
2. **Smelter workload concentration risk.** Smelter handled nearly 58
turnaround, SLA, and late count. This creates a system-level exposure.
3. **Environmental SLA risk.** Environmental area and Environmental sample type both showed SLA deterioration. This should be reviewed carefully because environmental workflows may carry compliance or reporting implications.
4. **Small-volume severity risk.** Maintenance and Tailings showed concerning SLA and re-run signals, but their sample counts were low. These should be monitored rather than overinterpreted.
5. **Hidden queueing risk.** Late samples became more frequent but not more severe. This suggests the lab may be accumulating minor SLA misses near operational thresholds rather than suffering isolated catastrophic delays.

Recommended Actions

Immediate Actions

1. **Review XRF-1 and XRF-2 maintenance and calibration records for May.** These two instruments are the strongest bottleneck candidates.
2. **Audit Smelter sample routing and queue timing.** Smelter volume is high enough that small workflow inefficiencies can materially affect total lab performance.
3. **Review Crushing and Acid Plant workflows.** These areas had the largest area-level turnaround increases and may be feeding work into constrained instrumentation.
4. **Investigate Environmental SLA deterioration.** Environmental area SLA declined sharply and Environmental sample type volume increased materially, suggesting potential scheduling, priority, routing, or SLA classification issues.
5. **Review technician assignments rather than individual performance alone.** Technician results should be reviewed in the context of instrument assignment, workload mix, and sample complexity.

Monitoring Actions

1. Track XRF turnaround and late samples weekly in June.
2. Add a queue-time metric if available.
3. Create an SLA miss severity view using late-hour buckets:
   - 0–1 hours late
   - 1–4 hours late
   - 4–8 hours late
   - 8+ hours late
4. Monitor Environmental, Maintenance, and Tailings separately due to targeted but uneven risk signals.
5. Add a technician-by-instrument matrix to avoid drawing unfair conclusions from technician-level KPIs.

Final Executive Narrative

In May 2026, the laboratory received 916 samples, essentially in line with the normalized January–April YTD expectation of 908 samples. Despite stable demand, average turnaround increased 8.9%, SLA compliance declined by 1.0 percentage point, and late sample count increased 9.0%. Re-run and rush volumes remained flat, indicating that the deterioration was not caused by unusual demand mix or increased rework.

The strongest evidence points to localized throughput pressure in XRF-supported workflows. XRF-1 and XRF-2 handled approximately 62% of May volume and both experienced double-digit increases in average turnaround. The Smelter department, which processed nearly 58% of May volume, also degraded across turnaround, SLA compliance, and late sample count.

Management should prioritize a review of XRF maintenance, calibration, staffing, and sample routing practices. Environmental SLA deterioration and selected technician-level performance changes should also be investigated, but technician findings should be interpreted in the context of instrument assignment and workload mix rather than isolated individual performance issues.