CUSTOMER DIRECTORY SPECIFICATION

Inflection analytical package v3

A concise specification of the delivery hierarchy, primary analytical results, and supporting evidence retained for each analysis unit.

01 - RESULTS FIRST	02 - ONE PACKAGE PER AU	03 - TRACEABLE
Primary callsets, alignments, copy-number tracks, and repeat-expansion outputs.	Each analysis unit is self-contained beneath a named delivery batch.	Manifest, checksums, component receipts, and report bundles travel with the analytical files.

IMPLEMENTATION BASELINE

Inflection Packaging v3 | DayOA 16.0.88.6 | 08 September 2026

Catalog command: `inflection-bjuice-product-v1.0`

Manifest schema: `dayoa.hiomr2_receipt_first_package/1.0`

Directory layout v3, catalog recipe v1.0, and manifest schema 1.0 are separate version identities. This document describes the implemented analytical package; it does not assert customer-release approval or completed delivery.

01 - ORIENTATION

How the package is organized

A delivery collection contains a named batch, and that batch contains one self-contained directory for each analysis unit. The active workflow uses Inflection Packaging v3.

1 - DELIVERY COLLECTION	2 - DELIVERY BATCH	3 - ANALYSIS UNIT
Stable collection for Inflection analytical terminal artifacts.	Explicit `seqone_delivery_batch_id` groups the AUs.	The exact analysis-unit UID identifies each package directory.

One directory, one analysis unit

```
<DayOA-clone>/results/day/hg38/deliveries/
  inflection_hiomr2_analytical_terminal_artifacts_v3/
    <delivery-batch>/<analysis-unit-uid>/
```

LOCATION	ROLE	WHEN TO USE IT
`results/`	Primary delivery files	Start here for callsets, CRAMs, copy number, ploidy, and ExpansionHunter results.
`reports/`	Human-readable review	Open the per-AU Inflection and shared final MultiQC reports with their complete bundles.
`qc/`	Compact quality evidence	Metrics, callset summaries, per-VCF statistics, and a scoped checksum list.
`experimental/`	Specialist supporting outputs	Normalized callers, locus-specific evidence, benchmark results, and retained originals.
`components/`	Native component evidence	Receipt-authorized artifacts in their source context; original AU identity may remain.
`independent/`	Other declared artifacts	Explicitly supplied artifacts without a dedicated delivery-path mapping.
`provenance/`	Traceability	Component status, routing, command bindings, identity, and transformation receipts.
package controls	Manifest and checksums	Exact inventory and integrity evidence at the AU root.

Naming model. The folder retains the analysis-unit UID. E below means the explicitly resolved external sample ID used by delivery filenames and delivery VCF/CRAM sample headers. It is not an invented identifier. Native component copies can retain the internal AU identity.

02 - DIRECTORY TREE

One analysis unit at a glance

This tree shows the practical v3 layout. Companion indexes sit beside their data files. Specialty content is conditional on configured components and their receipts; the manifest is the exact inventory.

```
<analysis-unit-uid>/
|-- results/                              PRIMARY DELIVERY
|   |-- E.snv.vcf.gz + .tbi                small variants
|   |-- E.cnv.vcf.gz + .tbi                copy-number variants
|   |-- E.sv.vcf.gz + .tbi                 consensus structural variants
|   |-- E.mito.vcf.gz + .tbi               mitochondrial variants
|   |-- E.eh.vcf.gz + .tbi                 repeat expansions
|   |-- E.eh.json, E.eh.tsv                repeat-expansion details
|   |-- E.sr.dedup.cram + .crai            short-read alignment
|   |-- E.lr.cram + .crai                  long-read alignment
|   `-- E.cn.tsv.gz + .tbi, E.ploidy.tsv    CN track and ploidy
|-- reports/
|   |-- E.inflection.multiqc.html          per-AU Inflection report
|   |-- E.inflection.multiqc.bundle.json   declared bundle members
|   |-- E.inflection.multiqc_files/        companion report assets
|   |-- E.inflection.multiqc.data.zip      report data archive
|   |-- DAY_final_multiqc.html             shared LSMC report copy
|   |-- DAY_final_multiqc.bundle.json      plus companion assets
|   |-- DAY_final_multiqc_data.zip         shared report data archive
|   `-- <role>/                           other declared report data
|-- qc/
|   |-- E.metrics.json, E.*.tagged.summary.txt
|   |-- E.manifest.txt
|   `-- vcf-sv-stats/                      per-callset statistics
|-- experimental/
|   |-- sv/, cnv/, segdup/, specialty/, roh-upd/, truvari/
|   |-- tiddit/E.native/                  native tree + transform inventory
|   `-- E.realigned.sr.cram + .crai        supporting alignment
|-- components/<component>/<role>/        native evidence copies
|-- independent/<role>/                   other explicit artifacts
|-- provenance/
|   |-- component-status-index.json, component-expectations.json
|   |-- observed-sex-routing.json, command-manifest.json
|   `-- components/                       terminal component receipts
|-- package_manifest.json                 inventory + transformations
`-- checksums.sha256                      root integrity list
```

A stable front door with deep evidence behind it

Use `results/` for delivery views. Reports support review; QC and provenance support verification. `components/` retains native evidence, so not every genomic file in the entire package is an external-ID delivery view. Missing or failed components must not be represented by fabricated successful calls.

03 - RESULTS

Results - primary analytical deliverables

Primary files use the delivery sample stem `E`. The transformations below affect prepared delivery views or private package copies, never the original scientific source files. Packaging does not recall variants or realign reads.

FILE	WHAT IT REPRESENTS	PACKAGING NOTE
`E.snv.vcf.gz` `E.snv.vcf.gz.tbi`	Small variants for annotation, review, and downstream interpretation.	**Transformed.** Consume the prepared view with only `FILTER=.` changed to `PASS`; other filters remain. Reheader to `E` and regenerate the index.
`E.cnv.vcf.gz` `E.cnv.vcf.gz.tbi`	Copy-number events with review annotations.	**Transformed.** `TAG=ModelRejected` or `NeedsReview-PossibleMissedCNV` maps to `FILTER=MLrejected`; other tags map to `PASS`. Preserve changed original filters in `IFX_ORIGINAL_FILTER`; reheader and reindex.
`E.sv.vcf.gz` `E.sv.vcf.gz.tbi`	Tagged consensus structural variants and caller-support evidence.	**Reheadered.** Consume the upstream tagged consensus; reheader to `E` and regenerate the index. Packaging does not rerun consensus calling.
`E.mito.vcf.gz` `E.mito.vcf.gz.tbi`	Mitochondrial variants.	**Transformed.** Set delivery FILTER to `PASS`; preserve changed original values in `IFX_ORIGINAL_FILTER`; reheader and reindex.
`E.eh.vcf.gz` `E.eh.vcf.gz.tbi`	ExpansionHunter repeat-expansion genotypes.	**Transformed.** Change exactly `LowDepth` to `PASS`; preserve changed original FILTER; leave other filters intact. Reheader and reindex.
`E.eh.json` `E.eh.tsv`	Structured repeat-expansion details and tabular summary.	**Preserved.** Copy receipt-authorized sidecars into the delivery naming layout.
`E.sr.dedup.cram` `E.sr.dedup.cram.crai`	Deduplicated short-read alignment.	**Header only.** Set CRAM read-group `SM` to `E`; regenerate and validate CRAI and reference compatibility.
`E.lr.cram` `E.lr.cram.crai`	Long-read alignment.	**Header only.** Set CRAM read-group `SM` to `E`; regenerate and validate CRAI and reference compatibility.
`E.cn.tsv.gz` `E.cn.tsv.gz.tbi`	Genome-positioned copy-number track.	**Prepared then copied.** The delivery track removes one leading `chr`; its original chr-prefixed form remains under `experimental/cnv/`.
`E.ploidy.tsv`	Canonical per-contig ploidy table.	**Preserved.** Consume the explicitly prepared, validated ploidy table; no new ploidy calculation during final packaging.

Interpretation. Delivery FILTER normalization is not new evidence of scientific PASS. Original-filter annotations and component receipts retain the distinction. A `.tbi` or `.crai` must match its adjacent packaged data file.

04 - SUPPORTING DIRECTORIES

Reports, quality, and supporting evidence

The Inflection-only MultiQC is per AU. The shared LSMC MultiQC is a separate analysis-level report and is also copied into each package.

LOCATION	KEY CONTENT	UTILITY AND HANDLING
`reports/`	`E.inflection.multiqc.html`	Focused per-AU report. Preserve its `.bundle.json` and every declared asset, plus the data ZIP. The HTML alone is not the whole report.
`reports/`	`DAY_final_multiqc.html`	Shared LSMC analysis report copy, with its bundle/assets and data ZIP. Original: `<clone>/results/day/hg38/reports/`.
`reports/`	Role-scoped JSON and source tables	Inflection data JSON is also retained at `inflection_multiqc_data/multiqc_data.json`. Other explicitly supplied reports retain their mapped role paths.
`qc/`	Metrics and tagged summaries	Descriptive callset/tag counts remain separate from truth/benchmark projection.
`qc/vcf-sv-stats/`	Statistics evidence	Statistics correspond to authorized VCF sources. gVCF-related rule names do not promise a delivered gVCF.
`experimental/sv/`	Normalized callers and untagged TrusSV	Supporting Sniffles2, LongReadSV, TIDDIT and consensus views; delivery copies are identity-normalized and reindexed.
`experimental/cnv/`	CNVscope and original CN track	Reheadered source CNVscope and the retained chr-prefixed track.
`experimental/`	SegDup, SMN, ROH/UPD, TIDDIT, Truvari	Receipt-authorized specialist evidence. Native TIDDIT genomic files are transformed with an inventory; non-genomic members are copied.
`components/`	Native artifacts by component and role	Source context and internal AU identity are intentional. This is not the primary delivery-view directory.
`provenance/`	Status, identity, routing and transform receipts	Binds the package to configured components, terminal outcomes and transformations. Inflection report validation is retained here.

TRANSFORMED	REHEADERED	PRESERVED	GENERATED
Content standardized by explicit delivery policy.	Delivery sample identity changed and indexes rebuilt.	Copied without a content rewrite.	Created to describe, index, or verify the package.

Portability. Report copying may rebase filename-dependent HTML links and bundle paths; it does not relabel measurements. Export or hosting must retain relative assets. A single presigned HTML URL does not authorize access to its separate files.

05 - WORKING WITH THE PACKAGE

Verification and practical use

Package integrity, scientific outcomes, and transport completion are separate claims. Verify the manifest and receipts rather than inferring success from a filename or a delivery FILTER value.

CONTROL	PURPOSE	HOW TO USE IT
`package_manifest.json`	Payload and identity contract	Read schema `dayoa.hiomr2_receipt_first_package/1.0`, package kind `inflection`, AU/external identities, artifact inventory, materialization and transformations.
`checksums.sha256`	Root integrity list	Covers files present after the package manifest is written, excluding the checksum file itself.
`qc/E.manifest.txt`	Earlier QC checksum scope	Covers files present before the final package manifest/root checksum. Different scope is intentional, not an integrity discrepancy.
`provenance/component-status-index.json`	Outcome map	Any `FAIL`: `COMPLETE_WITH_FAILURES`. Otherwise any `NO_CALL`: `COMPLETE_WITH_NO_CALLS`. Otherwise `PASS`. Disabled components remain explicit.
`reports/*.html` + bundles	Human review	Keep entry HTML, bundle manifests and declared assets together. Missing/corrupt receipt or artifact bindings are integrity errors, not no-calls.

1 - READ

Begin with the focused Inflection MultiQC and review limitations.

2 - ANALYZE

Use `results/` as the primary downstream analytical surface.

3 - VERIFY

Reconcile inventory, identities, checksum scopes and component receipts.

What remains stable

The AU directory is the unit of packaging. Primary files are in `results/`; reports in `reports/`; verification in `qc/` and `provenance/`; supporting evidence in `experimental/` and `components/`. Exact specialty content follows the configured matrix. A complete package may retain failed QC or caller components: failed Ganon is not a negative screen, and failed SegDup is not a validated no-call.

Acceptance boundary. `package_integrity=PASS` does not mean every scientific component passed. Required primary artifacts and valid bindings must still exist. Export requires its own successful DRA receipt; package creation does not establish recipient access or customer-release approval. Do not overwrite nonempty package roots or silently relabel historical packages.

Implementation authority. DayOA `16.0.88.6`, commit `56f87cfd2d2d17d9a2b5d7e717ab0e5bbbf26d12`: active packager, workflow rule, and bundle handling. This document updates the supplied directory-guide template to the v3 contract; no new workflow validation was performed.