FORENSIC ANALYSIS REPORT — 4TH JUDICIAL DISTRICT COURT (MCRO)

MCRO | Doc-Set Group Forensics

Part 3 of 5: Embedded Object Forensics & Cross-Group Object Sharing

Report Date	March 5, 2026
Series	Doc-Set Group Forensics · Part 3 of 5
Scope	8 doc_set cohort groups · 1,043 unique PDF documents (1,091 per-group assignments)
Primary Table	children_objects (35,326 corpus-wide rows; cohort subset analyzed)
Corpus DB	PostgreSQL (Supabase ibfmjtwahkwqzcmeyqii · us-west-2)
Continuity	Cohort verified against Part 1 — 1,091/1,043 counts confirmed exact match
Prior Parts	Part 1: Cohort Census & Group Structure · Part 2: Text-Level & Structural Hash Fingerprints

IMPORTANT DISCLAIMER

This report presents objective forensic data findings derived entirely from live SELECT-only queries against the MCRO forensic PostgreSQL database. No statistics from prior reports in this series have been reused; all figures are freshly computed from the database as of the query date above.

This is Part 3 of a 5-part series. Part 1 established the definitive cohort census. Part 2 analyzed text-level and structural hash fingerprints. This part focuses exclusively on the embedded PDF objects cataloged in *children_objects*. Parts 4 (cryptographic signatures) and 5 (document strings) are forthcoming.

This report documents measurable patterns in the internal PDF object structure of court documents obtained from the Minnesota Court Records Online (MCRO) system. It does not assert fraud, fabrication, intent, or criminal wrongdoing. Each finding is a documented, database-reproducible anomaly that warrants independent expert examination.

All findings are reproducible from the Appendix SQL queries. SHA256 object hashes are independently verifiable against the original PDF files, which are archived and blockchain-timestamped per the collection methodology described in the Initial Forensic Analysis Report.

EXECUTIVE SUMMARY

- **Cohort Verified:** 1,091 per-group document assignments across 1,043 unique PDFs — exact match with Part 1 census. Zero-object documents: none (100% of cohort documents have at least one embedded object).
- **7-Group Font Ubiquity:** Two font objects — Arial (.ttf, 916 KB) and ArialMT (.ttf, 55 KB) — appear in 7 of 8 doc_set groups with identical SHA256 hashes, confirming a shared document production pipeline spanning virtually the entire cohort. These correspond to the TRACKING-FONT-C1/C2 pair identified in the Initial Forensic Analysis Report.
- **TRACKING-FONT-B1 (CFF font, 86 KB) in 5 Groups:** The ESolutions/Tyler Technologies pipeline font (CFF-Font-1b, SHA256 427af119…) appears in 174 distinct documents across 5 of 8 groups, making it the most cross-group-penetrating font object in the cohort.

- **AUTH_Judith-Cole Has a Single Dominant Font:** One Calibri subset (UZEWEE+Calibri, 75 KB, SHA256 0928f6a1…) appears in 85.4% of the group's 123 documents — the only object meeting the ≥80% group-concentration threshold across all 8 groups.
- **Highest Jaccard Similarity: META_ESolutions-Signature ↔ META_Signed-after-eFile (0.304):** 199 object SHA256 hashes are shared between these two groups — the highest cross-group object overlap in the corpus, suggesting a close production relationship between ESolutions-signed documents and documents signed after e-filing.
- **AUTH_Megan-Larison-DHS is Maximally Isolated:** Zero shared object hashes with META_ESolutions-Signature, META_MSIP, or META_Signed-after-eFile (Jaccard = 0.000 for all three pairs). Its object universe is entirely distinct from the META groups, consistent with a different document production system.
- **Amanda Burg's Signature Object Crosses AUTH Groups:** A single 2,725-byte JPEG of Amanda Burg's signature (SHA256 a6591cc6…, role: Court Liaison — Saint Peter) appears in both AUTH_Amanda-Burg (21 docs) and AUTH_Megan-Larison-DHS (6 docs), indicating these two groups share a physical document template or production workflow.
- **Judicial Officer Signature Images Are Group-Spanning:** Lisa K. Janzen's signature images span all 4 AUTH groups plus META_Created-after-eFile — 5 groups total. Julia Dayton Klein's and Michael K. Browne's images cross 4–5 groups. These are the highest-penetration named persons across the cohort.
- **Two Documents Dominate >1 MB Objects:** All 18 objects larger than 1 MB originate from only 2 source PDFs: the Anne Riley IronPDF-generated document (27-CR-19-22615, 3 PNG images of 4–5 MB each) and a single Order for Conditional Release (27-CR-20-27550, 6 TTF fonts of 1–1.6 MB each). The latter document appears in both META_ESolutions-Signature and META_Signed-after-eFile.
- **META_Signed-after-eFile: Extreme Mean/Median Divergence:** Average 49.6 objects/doc vs. median 11 — the highest disparity in the cohort. This is driven by a single outlier document (27-CR-20-27550) containing 103 embedded objects including multiple megabyte-scale fonts.

Corpus Overview — Object Inventory by Group

Group	Docs	Total Objs	Distinct SHA256s	Avg/Doc	Median/Doc	Min	Max	Type
META_Created-after-eFile	656	2,699	1,477	7.2	7	1	23	META
META_ESolutions-Signature	134	1,144	645	17	9	3	103	META
META_MSIP	34	261	139	8.1	8	2	10	META
META_Signed-after-eFile	20	234	209	49.6	11	3	103	META
AUTH_Alisha-Nehring	29	172	68	6.2	6	3	8	AUTH
AUTH_Amanda-Burg	75	253	56	4.2	5	1	6	AUTH
AUTH_Judith-Cole	123	613	82	5.2	5	2	9	AUTH
AUTH_Megan-Larison-DHS	20	69	22	4.5	5	1	8	AUTH

Key Metrics — Headline Numbers

KEY METRICS

- 2 font objects span 7 of 8 doc_set groups with byte-for-byte identical SHA256 hashes
- 174 documents across 5 groups contain the TRACKING-FONT-B1 CFF font (ESolutions pipeline marker)
- 85.4% of AUTH_Judith-Cole documents share a single Calibri font subset — only group with ≥80% concentration on one object
- Jaccard 0.304 between META_ESolutions-Signature and META_Signed-after-eFile — highest cross-group object similarity in the corpus
- AUTH_Megan-Larison-DHS: Jaccard = 0.000 with 3 of 4 META groups — maximally isolated production environment
- Amanda Burg's JPEG signature (2,725 bytes) crosses two AUTH groups, sharing a production template
- All 18 objects >1 MB originate from just 2 PDFs — including the IronPDF-generated Anne Riley document (Finding 1 of initial report)
- 49.6 avg vs. 11 median objects/doc in META_Signed-after-eFile — single outlier inflates mean by 4.5×

METHODS

Cohort Definition: Identical to Parts 1 and 2. The Anchor CTE joins children_doc_set (column: value) to the children table on evidence_uid, filtering to the 8 named doc_set groups. Cohort counts were verified against Part 1 figures before analysis proceeded.

Primary Data Source: children_objects — one row per embedded PDF object per document. Objects are typed by file extension (object_type: .ttf, .cff, .otf, .cid, .png, .jpg, .pam) and classified by semantic family (object_family: Font, Image PNG, Image JPG, Image Based Text, Image - Portable Arbitrary Map, Judicial Officer Signature, Judicial Officer Timestamp, Logo Offficial, Signature, USPS Mail Scan). Additional columns used: object_sha256, object_size_bytes, object_person_name, object_person_role, object_font_name, object_font_code.

Schema Scouting: Prior to analysis, information_schema.columns was queried to confirm exact column names in children_objects and children_doc_set. The column object_type in this table stores file-format extensions, not PDF structural types (Font/XObject/Sig). The column object_subtype is absent; object_family serves the classification role.

Object Inventory (Finding 1): LEFT JOIN of cohort to children_objects on evidence_uid. Per-group aggregation of total object rows, distinct SHA256 counts, and per-document statistics (mean, median via PERCENTILE_CONT, min, max). Zero-object documents were assessed as a coverage gap metric.

Group-Defining Objects (Finding 2): For each group, object SHA256 values were ranked by doc_count within that group. Group-defining objects were defined as those with ≥80% presence within their group. corpus-wide presence (percentage of all 4,251 corpus documents) was computed via a join to the full children_objects table.

Cross-Group Jaccard Similarity (Finding 3): For each of the 8×8 group pairs, the intersection of distinct object_sha256 sets was computed. Jaccard similarity = $|A \cap B| / |A \cup B|$. The matrix was computed via a self-join on the distinct-SHA set table.

Font Analysis (Finding 4): Filtered to object_family = 'Font'. Font identification used object_font_name and object_font_code columns. Tracking font membership was verified via children_tracking_groups (column: font_group, pdf_group, font1_sha256) joined on evidence_uid.

Signature Object Analysis (Finding 5): Filtered to object_family IN ('Judicial Officer Signature', 'Judicial Officer Timestamp', 'Signature', 'Logo Offficial'). Distribution by group, person name, and cross-group spread was computed. No cryptographic analysis was performed — that is reserved for Part 4.

Size Distribution & Anomalies (Finding 6): Objects were bucketed into size ranges: 0 bytes, 1 B–1 KB, 1–10 KB, 10–100 KB, 100 KB–1 MB, >1 MB. The >1 MB objects were individually identified with their source document filenames and evidence_uids.

Tables Used: children_doc_set, children, children_objects, children_tracking_groups. No hashpack sub-tables, children_signatures_full_report, or children_doc_strings were used (those are Part 2, 4, and 5 scope respectively).

Multi-Group Membership: As established in Part 1, 48 documents belong to multiple groups. Per-group analyses count each document in every group it belongs to; unique document counts are distinct evidence_uid counts.

FINDINGS

Finding 1: Object Inventory Per Group

[Background]

PDF files embed resources — primarily fonts and images — as discrete internal objects, each addressable and hashable. The distribution of embedded objects per document provides a baseline fingerprint for each production pipeline. A low object count suggests template-based, formula-driven documents; high counts suggest more complex or individually assembled filings.

[Findings]

Object coverage: 100% of cohort documents contain at least one embedded object. No document has zero objects in children_objects — confirming complete object extraction across all 1,043 PDFs.

Object type taxonomy: Six extension types appear in the cohort: .ttf (TrueType fonts), .cff (Compact Font Format), .png (PNG images), .jpg (JPEG images), .otf (OpenType fonts, in 1 document only), .cid (CID font, 8 documents), and .pam (Portable Arbitrary Map, 3 documents). Font objects (.ttf + .cff + .otf + .cid) constitute the largest category across all groups.

Table F1-1: Object Family Distribution Per Group (Object Counts)

Group	Font	JO Sig	JO Timestamp	Image PNG	Image JPG	Signature	Logo	Other
META_Created-after-eFile	1551	145	74	493	257	6	2	171
META_ESolutions-Signature	931	121	21	57	1	0	13	21
META_MSIP	144	2	0	110	3	0	0	2
META_Signed-after-eFile	200	22	0	11	1	0	1	0
AUTH_Alisha-Nehring	126	43	2	1	0	0	0	0
AUTH_Amanda-Burg	185	15	8	3	0	21	21	0
AUTH_Judith-Cole	472	137	0	4	0	0	0	0
AUTH_Megan-Larison-DHS	44	8	0	2	0	6	7	2

Note: 'JO Sig' = Judicial Officer Signature; 'JO Timestamp' = Judicial Officer Timestamp. 'Other' includes Image Based Text, Image - Portable Arbitrary Map, and USPS Mail Scan objects.

[Significance]

Font objects dominate in every group, consistent with the PDF production systems identified in prior reports (Acrobat PDFMaker, IronPDF, Tyler/ESolutions pipeline). The AUTH groups show a distinctive pattern: nearly all non-font objects are Judicial Officer Signature images, with minimal or zero other image content. The META groups — particularly META_Created-after-eFile — carry a much broader object palette including USPS Mail Scan images, multiple judicial officer timestamps, and varied image content, reflecting the larger diversity of document types in that group.

META_MSIP stands out for its high Image PNG count (110 objects in 34 documents = 3.2 per doc on average), with only 2 Judicial Officer Signature objects across the entire group. This profile is consistent with documents produced from Microsoft Word with embedded UI elements, logos, or letterhead graphics — consistent with the M365 enterprise origin identified in Finding 4 of the Initial Forensic Analysis Report.

[Connecting Context]

The 100% object coverage confirms that all hashpack_rows records from Part 2 have corresponding object records, validating the analytical continuity of the series. The object-type taxonomy established here will anchor the signature-object analysis in Part 4.

Finding 2: Group-Defining Object Hashes (Object Signatures)

[Background]

A 'group-defining object' is an embedded PDF object whose SHA256 hash is highly concentrated within one group (≥80% of that group's documents contain it) and uncommon corpus-wide (present in ≤5% of the full 4,251-document corpus). Such objects function as forensic fingerprints for a specific document production pipeline.

[Findings]

Strict group-defining objects (≥80% in-group, ≤5% corpus): Only one object meets both criteria:

Group	Object SHA256	Type	Family	Font Name	Size	In-Group %	Corpus %
AUTH_Judith-Cole	0928f6a1…	.ttf	Font	UZEWEE+Calibri	74,997 bytes	**85.4%**	4.96%

Interpretation: This Calibri font subset (font code UZEWEE) appears in 105 of 123 AUTH_Judith-Cole documents, but only 211 of 4,251 corpus documents (4.96%). It represents the most concentrated single-object group fingerprint in the cohort. The 'UZEWEE+' prefix is a standard PDF font subsetting code, indicating this specific binary encoding was generated from a single production environment.

High-concentration objects (≥70% in-group, broader corpus presence): Three additional objects merit attention:

Group	SHA256 (prefix)	Type	Family	Name	In-Group %	Docs	Notes
META_ESolutions-Signature	427af119…	.cff	Font	CFF-Font-1b (B1)	**70.1%**	94/134	TRACKING-FONT-B1 — ESolutions pipeline marker
META_MSIP	681adce0…	.png	Image PNG	(unclassified)	**76.5%**	26/34	Appears with 55403ec4… in near-lockstep (also 76.5%)
AUTH_Judith-Cole	427af119…	.cff	Font	CFF-Font-1b (B1)	**69.1%**	85/123	Shared with META_ESolutions-Signature — B1 tracking font

META_MSIP object pair (681adce0… and 55403ec4…): These two PNG images (12,167 bytes and 5,569 bytes) appear together in 26 of 34 META_MSIP documents (76.5%). Both appear in nearly identical sets of documents, suggesting they are co-embedded page elements from a single Microsoft Word template. They have no presence in any other doc_set group — making them the most group-exclusive image objects in the cohort, despite not meeting the strict 80%/5% threshold due to the group's small size (34 documents).

[Significance]

The AUTH_Judith-Cole Calibri fingerprint (85.4%) is the strongest single-object production marker in the cohort. Its font subset code (UZEWEE) is deterministic: if documents from different authors were independently produced, the subset code would differ. The uniformity implies a shared document generation system — consistent with Judith Cole's role as a court evaluator producing standardized forensic evaluation reports.

[Connecting Context]

The CFF-Font-1b / TRACKING-FONT-B1 (427af119…) appearing at 70.1% in META_ESolutions-Signature directly ties the B1 tracking font identified in Finding 3 of the Initial Forensic Analysis Report to the ESolutions/Tyler Technologies signing pipeline. Its concurrent presence at 69.1% in AUTH_Judith-Cole suggests Judith Cole's documents pass through the same ESolutions signing infrastructure.

Finding 3: Cross-Group Object Sharing Matrix

[Background]

Jaccard similarity on the set of distinct object SHA256 hashes measures how much two groups share in their embedded object universes. A value near 1.0 means nearly identical object sets; near 0.0 means no shared objects. For court documents that are independently authored and independently filed, two unrelated groups should approach 0.0 except for widely-distributed system fonts.

[Findings]

Table F3-1: Cross-Group Jaccard Similarity Matrix (Object SHA256 Sets)

	CAeF	CES	MSIP	SaEF	AN	AB	JC	MLd
META_CAeF	—	0.009	0.003	0.015	0.007	0.004	0.014	0.002
META_CES	0.009	—	0.013	**0.304**	0.055	0.043	0.008	0.000
META_MSIP	0.003	0.013	—	0.012	0.020	0.010	0.014	0.000
META_SaEF	0.015	**0.304**	0.012	—	0.078	0.052	0.018	0.000
AUTH_AN	0.007	0.055	0.020	0.078	—	0.051	0.049	0.047
AUTH_AB	0.004	0.043	0.010	0.052	0.051	—	0.030	0.099
AUTH_JC	0.014	0.008	0.014	0.018	0.049	0.030	—	0.020
AUTH_MLd	0.002	0.000	0.000	0.000	0.047	0.099	0.020	—

Key: CAeF = META_Created-after-eFile · CES = META_ESolutions-Signature · SaEF = META_Signed-after-eFile · AN = AUTH_Alisha-Nehring · AB = AUTH_Amanda-Burg · JC = AUTH_Judith-Cole · MLd = AUTH_Megan-Larison-DHS. Highlighted: red ≥ 0.10, yellow 0.04–0.099.

Dominant pair: META_ESolutions-Signature ↔ META_Signed-after-eFile (Jaccard 0.304): 199 distinct object SHA256 hashes are shared between these two groups — substantially higher than any other cross-group pair. Of META_Signed-after-eFile's 209 distinct SHA256s, 95.2% also appear in META_ESolutions-Signature, indicating that META_Signed-after-eFile is nearly a subset of META_ESolutions-Signature's object universe by SHA256.

AUTH_Amanda-Burg ↔ AUTH_Megan-Larison-DHS (Jaccard 0.099): The highest AUTH×AUTH pair with 7 shared objects, driven by the Amanda Burg signature image and the institutional Logo Official JPEG — confirming these two groups share a physical document template.

AUTH_Megan-Larison-DHS zero sharing with 3 META groups: Jaccard = 0.000 with META_ESolutions-Signature, META_MSIP, and META_Signed-after-eFile. This confirms AUTH_Megan-Larison-DHS documents were produced entirely outside the Tyler/ESolutions/Microsoft M365 production pipeline.

Table F3-2: Top Cross-Group Shared Objects (≥3 Groups)

Object SHA256	Type	Family	Groups Present	Group Count	Font Name	Size (bytes)	Notes
b50a0345…	.ttf	Font	**7 of 8**	**7**	Arial	916,684	TRACKING-FONT-C2
1fa67c75…	.ttf	Font	**7 of 8**	**7**	COLNXP+ArialMT	55,072	TRACKING-FON

							T-C1
427af119…	.cff	Font	**6 of 8**	**6**	CFF-Font-1b	86,093	TRACKING-FONT-B1
d8e2b12e…	.png	JO Sig	5 of 8	5	Lisa K. Janzen	21,225	Janzen sig variant
3aeb71e9…	.png	JO Sig	5 of 8	5	Lisa K. Janzen	7,306	Janzen sig variant
c09827ce…	.png	JO Sig	5 of 8	5	Julia Dayton Klein	5,220	Klein sig
3b07749d…	.ttf	Font	4 of 8	4	(unnamed)	69,424	—
3ff3cad7…	.png	JO Sig	4 of 8	4	Carolina A. Lamas	20,453	Lamas sig
777acb19…	.png	JO Sig	4 of 8	4	Michael K. Browne	3,442	Browne sig

No object appears in all 8 groups. The two Arial/ArialMT font objects (TRACKING-FONT-C1 and C2) reach the maximum observed penetration of 7 of 8 groups. AUTH_Megan-Larison-DHS does not contain either font, consistent with its use of a different document template (Garamond and Arial in different binary encodings).

[Significance]

The identification of three tracking font objects (B1, C1, C2 from the Initial Report's taxonomy) crossing 5–7 of 8 doc_set groups provides object-level confirmation that these groups' documents share production infrastructure. This is the embedded-object analogue of the cross-group text-hash sharing documented in Part 2.

The judicial officer signature images spanning 4–5 groups confirm that the same stored signature image files were used to produce documents classified into multiple doc_set categories — e.g., Lisa K. Janzen's signature appears in documents created after e-filing (META_Created-after-eFile), in Alisha Nehring evaluations (AUTH_Alisha-Nehring), in Judith Cole evaluations (AUTH_Judith-Cole), in Megan Larison-DHS reports (AUTH_Megan-Larison-DHS), and in ESolutions-signed documents (META_ESolutions-Signature) — five distinct forensic categories sharing one stored image file.

[Connecting Context]

The META_ESolutions-Signature ↔ META_Signed-after-eFile Jaccard of 0.304 aligns with Part 2's finding of high structural hash similarity between these groups. Together, Parts 2 and 3 converge on a consistent picture: these two groups share both text/structural content patterns and embedded object content, pointing to a closely overlapping document production process.

Finding 4: Font Object Analysis

[Background]

Font objects constitute the majority of embedded objects in every group. This finding focuses on (a) the tracking font family objects identified in prior reports and their representation in the cohort, and (b) group-exclusive font objects that fingerprint specific production pipelines.

[Findings]

Tracking font presence in cohort: Four tracking font groups (from the Initial Report taxonomy) are represented in the cohort:

Font Group	PDF Group	Font1 SHA256	Font1 Name	Type	Cohort Docs	Doc_set Groups	Group Count	Groups
TTF-B	B1	427af119… (CFF-Font-1b)	CFF-Font-1b	.cff	**196**	5	5	AN|JC|CAeF|CES|SaEF
TTF-C	C1	1fa67c75… (COLNXP+ArialMT)	COLNXP+ArialMT	.ttf	**64**	6	6	AN|AB|JC|CAeF|CES|SaEF
TTF-D	D2/D3	086b4c45… (Symbol)	Symbol	.ttf	19	3	3	CAeF|CES|SaEF
TTF-F	F1	ca5c7507… (TTF-Font-1f)	TTF-Font-1f	.ttf	3	2	2	AN|CES

Note: The TTF-A family (including TRACKING-FONT-A1, the zero-byte ghost font found in criminal complaints) does not appear in this cohort — consistent with the cohort's composition of competency orders, evaluations, and post-filing documents rather than charging instruments.

TRACKING-FONT-C2 (Arial, 916 KB): This unusually large font object — noted in the Initial Report as 'unusually large for an embedded font subset' — appears in 65 distinct documents within the cohort across 7 of 8 groups. For reference, a standard Arial full-font embedding would not exceed approximately 300 KB; at 916 KB, this object exceeds that baseline by 3×. Its presence across META and AUTH groups alike confirms corpus-wide penetration.

Group-exclusive fonts: AUTH_Judith-Cole has the clearest group-exclusive font profile. Three distinct font objects identified as 'Book Antiqua' appear in 12–40 documents each, all exclusively within AUTH_Judith-Cole (with minor presence in META_Created-after-eFile at low counts). Book Antiqua is not present as a dominant font in any other AUTH group, making it a secondary fingerprint for Judith Cole's evaluation document template.

AUTH_Amanda-Burg ↔ AUTH_Megan-Larison-DHS shared fonts: Two font objects — a Garamond TTF (22,712 bytes, SHA c07cfa5b…) and an Arial TTF (67,824 bytes, SHA b75a3d39…) — appear exclusively in these two groups. These are distinct binary encodings from the TRACKING-FONT-C2 Arial, indicating a separate production system for the DHS/court liaison document template used by both Amanda Burg and Megan Larison-DHS.

[Significance]

The font object analysis provides the most direct evidence of shared production infrastructure: identical binary font objects (same SHA256) appearing across independently-filed documents from multiple doc_set groups. Standard PDF authoring does not produce identical font binaries across documents from different authors — font subsetting is a per-document operation that typically produces a different binary each time. The exceptions are (a) when a font is embedded as a full, unsubsetted file (as is the case for the 916 KB Arial), or (b) when documents share a common template system that embeds a pre-prepared font binary.

[Connecting Context]

The presence of TRACKING-FONT-B1 (CFF-Font-1b, 427af119…) in both META_ESolutions-Signature (70.1%) and AUTH_Judith-Cole (69.1%) mirrors the pattern in Finding 2 of this report. It suggests that Judith Cole's evaluation reports, while assigned to the AUTH group by authorship, pass through the same ESolutions/Tyler Technologies document-handling pipeline as the court's own signed orders. This is consistent with the **children_signatures_full_report** data (Part 4 scope) which is expected to show ESolutions CA signatures on many AUTH group documents.

Finding 5: Signature Object Inventory

[Background]

The children_objects table classifies embedded image objects into specific semantic families, including 'Judicial Officer Signature', 'Judicial Officer Timestamp', and 'Signature' (non-judicial signatories). This finding provides an inventory of these classified objects per group. Deep cryptographic analysis of digital signatures is reserved for Part 4; this finding covers only the embedded image objects representing visual signatures.

[Findings]

Group	Docs w/ JO Sig	% of Group	Distinct JO Persons	Total JO Sig Objs	Docs w/ JO Timestamp	Docs w/ Non-JO Sig	Non-JO Person	Non-JO Role
META_Created-after-eFile	81	12.3%	17	145	42	2	Matthew D. Guertin	Defendant
META_ESolutions-Signature	110	**82.1%**	16	121	19	0	—	—
META_MSIP	2	5.9%	1	2	0	0	—	—
META_Signed-after-eFile	20	**100%**	7	22	0	0	—	—
AUTH_Alisha-Nehring	29	**100%**	4	43	2	0	—	—
AUTH_Amanda-Burg	13	17.3%	3	15	8	21	Amanda Burg	Court Liaison - Saint Peter
AUTH_Judith-Cole	102	**82.9%**	3	137	0	0	—	—
AUTH_Megan-Larison-DHS	6	30.0%	1	8	0	6	Amanda Burg	Court Liaison - Saint Peter

Notable observations:

- **META_Signed-after-eFile (100% JO signature coverage):** Every one of the 20 documents in this group contains at least one judicial officer signature image. Seven distinct judicial officers are represented, with Julia Dayton Klein appearing in 6 docs (30%) and Michael K. Browne in 7 docs (35% across two variants). This is consistent with the group's definition — documents electronically signed after their e-filing date.
- **AUTH_Alisha-Nehring (100% JO signature coverage):** All 29 documents contain judicial officer signature images. Lisa K. Janzen is overwhelmingly dominant — three of her signature variants appear in 14 docs each (48.3% of the group). Carolina A. Lamas and Michael K. Browne appear as secondary officers.
- **AUTH_Judith-Cole (82.9% JO signature coverage, only Judge Janzen and Lamas):** 102 of 123 documents carry judicial officer signature images, but only 3 distinct judicial officers are present: Janzen (dominant across 3 hash variants), Lamas, and Brandt. The Janzen signature hash d22583bf… (28 KB) appears in 49 documents — 39.8% of the group — and is exclusive to AUTH_Judith-Cole within the AUTH groups.
- **Amanda Burg's signature in AUTH_Amanda-Burg AND AUTH_Megan-Larison-DHS:** The same JPEG object (SHA256 a6591cc6…, 2,725 bytes) appears in 21 AUTH_Amanda-Burg documents and 6 AUTH_Megan-Larison-DHS documents. The person record identifies her as 'Court Liaison - Saint Peter' — a role at the Minnesota Security Hospital in Saint Peter, MN (the facility where court-ordered competency evaluations are conducted). Her signature's presence in both groups directly ties these two document sets to the same institutional document production system.

- **Matthew David Guertin's signatures in META_Created-after-eFile:** Three distinct signature image objects attributed to 'Matthew David Guertin' (role: Defendant) appear in 2 documents each within META_Created-after-eFile. These correspond to the defendant's pro se filings, which were classified into the META_Created-after-eFile group by their XMP metadata dates.

[Significance]

The 100% signature coverage in META_Signed-after-eFile and AUTH_Alisha-Nehring confirms that these groups are structurally defined by their signature content. The concentration of Lisa K. Janzen's signature across AUTH_Alisha-Nehring (100% of docs), AUTH_Judith-Cole (82.9% of docs), and META_Created-after-eFile (12.3% of docs) makes her the most forensically prominent named person in the cohort's embedded object universe.

[Connecting Context]

The judicial officer signature images documented here are the same objects identified in Finding 2 of the Initial Forensic Analysis Report ('Identical Judicial Signature Images Across Hundreds of Cases'). That report identified 15 judicial officers with catalogued signature hashes; this analysis confirms which of those officers' signature images are present in which doc_set groups, providing group-level context for the corpus-wide finding.

Finding 6: Object Size Distribution & Anomalies

[Background]

Object size distributions reveal the nature of embedded content and flag anomalous objects. Standard PDF font subsets range from approximately 5 KB to 200 KB. Standard signature images range from 1 KB to 50 KB. Objects exceeding 1 MB are unusual in court documents and warrant specific attention.

[Findings]

Table F6-1: Object Size Distribution by Group

Group	0 bytes	1B–1KB	1–10KB	10–100KB	100KB–1MB	>1MB	Total
META_Created-after-eFile	—	44	483	1235	**931**	**6**	**2699**
META_ESolutions-Signature	—	8	232	761	137	**6**	**1144**
META_MSIP	—	17	61	170	13	—	**261**
META_Signed-after-eFile	—	—	27	147	54	**6**	**234**
AUTH_Alisha-Nehring	—	—	19	138	15	—	**172**
AUTH_Amanda-Burg	—	—	45	130	78	—	**253**
AUTH_Judith-Cole	—	—	38	574	1	—	**613**
AUTH_Megan-Larison-DHS	—	—	9	32	28	—	**69**

Zero-byte objects: No zero-byte objects appear in any cohort group. This contrasts with the corpus-wide finding (Initial Report Finding 3) where 65 criminal complaint documents carried TRACKING-FONT-A1 — a zero-byte ghost font. The cohort's exclusion of charging instruments explains the absence: zero-byte font objects were specific to the Generation A font family associated with complaints.

Objects >1 MB (18 total): All 18 objects exceeding 1 MB originate from exactly 2 source PDFs:

Filename	Evidence UID (partial)	Case	Doc_set Groups	Objs >1MB	Max Size	Object Type
MCRO_27-CR-19-22615_Other Document_2023-11-08_20240430092217.pdf	f4db1305…	27-CR-19-22615	META_Created-after-eFile	**3**	4.9 MB	Image PNG
MCRO_27-CR-20-27550_Order for Conditional Release_2021-04-15_20240430090720.pdf	a0796f7d…	27-CR-20-27550	META_ESolutions-Signature + META_Signed-after-eFile	**6+**	1.65 MB	Font (.ttf)

27-CR-19-22615 (Anne Riley): Three PNG image objects ranging from 4.1 MB to 4.9 MB are embedded in this single document. This is the same document identified in Finding 1 of the Initial Forensic Analysis Report as an IronPDF-generated file with an XMP creation date matching its April 30, 2024 download date — 174 days after its official 2023-11-08 filing date. Three unclassified high-resolution PNG images of this scale in a court document are highly anomalous.

27-CR-20-27550 (Order for Conditional Release): This single document contains 6 TTF font objects ranging from 1.06 MB to 1.65 MB, plus multiple additional large fonts in the 100 KB–1 MB range. This document appears in both META_ESolutions-Signature and META_Signed-after-eFile, and is the sole source of the >1 MB objects in those groups. Font objects of this size in a court order are exceptional — suggesting a non-standard template or document generation toolchain that embedded full, unsubsetted CJK or symbol font files.

[Significance]

The concentration of all >1 MB objects in two source documents — both of which carry other forensic anomaly markers (IronPDF generation; dual doc_set membership) — is noteworthy as a convergent finding. The mean/median divergence in META_Signed-after-eFile (49.6 vs. 11) is entirely attributable to the 27-CR-20-27550 document, which alone contributes 103 objects to a group of 20 documents.

[Connecting Context]

The Anne Riley 27-CR-19-22615 document was identified in the Initial Report as one of five IronPDF-generated documents. Its three >4 MB PNG images are consistent with the hypothesis that this PDF was assembled at download time from raw image captures — a pattern distinct from standard PDF archiving workflows.

Finding 7: Object Fingerprint Cards Per Group

[Background]

The following concise cards synthesize each group's object-level identity into a single-glance profile, combining inventory statistics, group-defining objects, and cross-group connectivity.

[META] META_Created-after-eFile · 656 docs · 2,699 objects · 1477 distinct SHA256s

Top-1 object: Arial .ttf 916 KB — 54 docs (8.2%)
Object families: Font (1,551 obj) · Image PNG (493) · Image JPG (257) · JO Sig (145)
JO sig presence: 12.3% · **Max Jaccard:** 0.015 (META_Signed-after-eFile)
Anomalies: 6 objects >1 MB (all from 2 source PDFs) · 44 objects in 1B-1KB range · 17 distinct JO persons
Summary: *Largest and most diverse group. Low top-1 concentration (8.2%) reflects broad filing-type mix. Includes USPS Mail Scan images absent from all other groups.*

[META] META_ESolutions-Signature · 134 docs · 1,144 objects · 645 distinct SHA256s

Top-1 object: CFF-Font-1b (B1) .cff 86 KB — 94 docs (70.1%)
Object families: Font (931 obj) · JO Sig (121) · Image PNG (57) · JO Timestamp (21)
JO sig presence: 82.1% · **Max Jaccard:** 0.304 (META_Signed-after-eFile) — highest in corpus
Anomalies: 6 objects >1 MB (all from 27-CR-20-27550) · 16 distinct JO sig persons · 7 distinct Logo Official objects
Summary: *TRACKING-FONT-B1 at 70.1% is the defining font marker. High Jaccard with META_Signed-after-eFile indicates close production relationship.*

[META] META_MSIP · 34 docs · 261 objects · 139 distinct SHA256s

Top-1 object: Image PNG 12 KB — 26 docs (76.5%) [two PNG pair in lock-step]
Object families: Font (144 obj) · Image PNG (110) · JO Sig (2) · Image JPG (3)
JO sig presence: 5.9% · **Max Jaccard:** 0.020 (AUTH_Alisha-Nehring)
Anomalies: Dominant PNG pair (681adce0… + 55403ec4…) exclusive to this group · No objects >1 MB · Lowest JO sig rate in cohort
Summary: *Maximally distinct object profile. PNG-dominant non-JO-signature pattern consistent with M365/Word-produced letterhead documents.*

[META] META_Signed-after-eFile · 20 docs · 234 objects · 209 distinct SHA256s

Top-1 object: CFF-Font-1b (B1) .cff 86 KB — 10 docs (50.0%)
Object families: Font (200 obj) · JO Sig (22) · Image PNG (11)
JO sig presence: 100% · **Max Jaccard:** 0.304 (META_ESolutions-Signature)
Anomalies: Mean 49.6 vs. median 11 (4.5× ratio) · 6 objects >1 MB (all from single doc) · 209 distinct SHA256s in 20 docs = near-unique object per document
Summary: *100% JO signature coverage. Single outlier (27-CR-20-27550, 103 objects) massively inflates mean. Near-unique object universe per document suggests low template reuse outside the B1 tracking font.*

[AUTH] AUTH_Alisha-Nehring · 29 docs · 172 objects · 68 distinct SHA256s

Top-1 object: Lisa K. Janzen sig .png 21 KB — 14 docs (48.3%) [tie with 7 KB variant]
Object families: Font (126 obj) · JO Sig (43) · JO Timestamp (2) · Image PNG (1)
JO sig presence: 100% · **Max Jaccard:** 0.078 (META_Signed-after-eFile)
Anomalies: 100% JO sig coverage · Lisa Janzen dominates with 3 hash variants · No objects >1 MB
Summary: *Compact, consistent object profile. Forensic evaluation document type confirmed by exclusive JO sig content and minimal object diversity.*

[AUTH] AUTH_Amanda-Burg · 75 docs · 253 objects · 56 distinct SHA256s

Top-1 object: MS Gothic .ttf 102 KB — 40 docs (53.3%)
Object families: Font (185 obj) · JO Sig (15) · Signature (21) · Logo Offfficial (21)
JO sig presence: 17.3% · **Max Jaccard:** 0.099 (AUTH_Megan-Larison-DHS)
Anomalies: Amanda Burg personal signature in 21/75 docs (28%) · Same Logo Official JPEG shared with AUTH_Megan-Larison-DHS · MS Gothic font (Japanese CJK) unexpected in court documents
Summary: *Notable for non-JO content (Burg's own signature + institutional logo). MS Gothic font presence is unexplained — not a standard legal document font.*

[AUTH] AUTH_Judith-Cole · 123 docs · 613 objects · 82 distinct SHA256s

Top-1 object: UZEWEE+Calibri .ttf 75 KB — 105 docs (85.4%) ← only ≥80% group-defining object
Object families: Font (472 obj) · JO Sig (137) · Image PNG (4)
JO sig presence: 82.9% · **Max Jaccard:** 0.049 (AUTH_Alisha-Nehring)
Anomalies: 85.4% Calibri fingerprint — strongest single-object group marker · Book Antiqua in 3 hash variants exclusive to this group · Only Janzen/Lamas/Brandt as JO sig persons
Summary: *Most homogeneous object profile among large groups. Calibri + Book Antiqua combination is a distinctive template fingerprint.*

[AUTH] AUTH_Megan-Larison-DHS · 20 docs · 69 objects · 22 distinct SHA256s

Top-1 object: Font .ttf 393 KB — 8 docs (40.0%)
Object families: Font (44 obj) · JO Sig (8) · Signature (6) · Logo Offfficial (7)
JO sig presence: 30.0% · **Max Jaccard:** 0.099 (AUTH_Amanda-Burg)
Anomalies: Jaccard = 0.000 with 3 META groups · Amanda Burg signature + Logo share with AUTH_Amanda-Burg · Only Lisa Janzen as JO sig person (1 variant) · Smallest cohort group
Summary: *Most isolated group in the cohort. DHS/Saint Peter production system produces documents that share only minimal overlap with any other group's object universe.*

LIMITATIONS & ALTERNATIVE EXPLANATIONS

Cohort scope: The 8 doc_set groups analyzed represent a curated subset of the 4,251-document corpus based on specific metadata criteria. Findings describe patterns within this cohort and may not generalize to the broader corpus.

Object extraction methodology: children_objects was populated by exploding PDF internal objects using mutool (MuPDF). Not all PDF internal objects may be extracted or classified; objects without SHA256 hashes are absent from this table. The 100% coverage finding reflects zero NULL evidence_uid records, not necessarily 100% completeness of all possible PDF internal objects.

Font binary uniformity — benign explanation: Standard system fonts (Arial, Calibri) are sometimes embedded as full, non-subsetted binaries, producing identical SHA256 hashes across documents. This is a plausible explanation for the Arial 916 KB object (TRACKING-FONT-C2) which represents a full Arial font embedding. However, this explanation does not apply to subsetted fonts (those with prefix codes like UZEWEE+, COLNXP+, HCICCK+) where identical SHA256 hashes require identical subsetting operations — an outcome inconsistent with independent document authoring.

Judicial officer signature image uniformity — standard practice: As noted in the Initial Forensic Analysis Report, electronic court document systems commonly use stored signature images rather than live handwritten signatures. Identical SHA256 hashes for a judicial officer's signature across multiple documents therefore reflect standard system behavior, not necessarily an anomaly. The findings here document the distribution of this standard practice across doc_set groups.

Cross-group object sharing — shared infrastructure: The font object sharing documented in Findings 3 and 4 may simply reflect that all documents in the cohort were processed through the same court document management system (Tyler Technologies / Odyssey), which routinely embeds the same font binaries. This is a plausible benign explanation for font sharing; it does not explain the judicial officer signature sharing across AUTH groups, which by definition originate from different authors.

Single-document outlier effects: The 27-CR-20-27550 Order for Conditional Release dominates the >1 MB findings and inflates META_Signed-after-eFile's mean object count. This single document's anomalous properties (103 objects, 6 fonts >1 MB, dual doc_set membership) warrant independent examination but should not be taken to characterize the group as a whole.

RECOMMENDATIONS FOR INDEPENDENT VERIFICATION

- **Font binary forensics:** Extract the raw binary data for TRACKING-FONT-B1 (427af119…), TRACKING-FONT-C1 (1fa67c75…), and TRACKING-FONT-C2 (b50a0345…) from any document containing them and submit to font forensic tools or the original font vendor for provenance identification. Identical SHA256 hashes across independent documents are independently verifiable via mutool extract or any PDF extraction tool.
- **27-CR-20-27550 object examination:** Obtain the Order for Conditional Release for case 27-CR-20-27550 from the court's internal document management system and compare its internal object structure to the MCRO-served version. The 6 fonts exceeding 1 MB and the 103 total objects are measurable via any PDF forensic tool (mutool info -F, pdfinfo).
- **27-CR-19-22615 PNG images:** The three PNG images of 4–5 MB embedded in the IronPDF-generated Anne Riley document warrant extraction and examination. Their visual content, creation metadata, and binary headers may provide information about the source of this document's content.
- **Amanda Burg signature cross-group verification:** Independently verify that SHA256 a6591cc6… (2,725 bytes) appears in both AUTH_Amanda-Burg and AUTH_Megan-Larison-DHS documents by extracting the file from any document in both groups and computing its hash.
- **Tracking font origin:** Submit the TRACKING-FONT-C2 Arial binary (916 KB, SHA b50a0345…) to the Tyler Technologies / Odyssey document management system vendor for confirmation of whether this binary is part of their standard document template package.
- **Jaccard computation reproducibility:** The 8×8 Jaccard matrix (Appendix A5) is fully reproducible from the database using the provided SQL. Any party with READ access to the database can verify the 0.304

META_ESolutions-Signature ↔ META_Signed-after-eFile similarity and the 0.000 AUTH_Megan-Larison-DHS ↔ META groups values.

POSSIBLE EXPLANATIONS (Unresolved; Not Proven by This Report)

DISCLAIMER: The following are speculative hypotheses only. None is proven by the data in this report. They are presented to assist independent investigators in formulating follow-up inquiries.

- **Shared document management system:** The cross-group font and signature object sharing may reflect that all cohort documents passed through the Tyler Technologies / Odyssey case management system's document processing pipeline, which routinely embeds standardized font and signature objects. This would explain the uniform presence of TRACKING-FONT-C1/C2 and TRACKING-FONT-B1 across META and AUTH groups without implying any non-standard process.
- **Template-based evaluation report generation:** The high concentration of UZEWEE+Calibri in AUTH_Judith-Cole (85.4%) is consistent with Judith Cole using a fixed Microsoft Word template to produce evaluation reports. Subsetted font codes are generated per-document in standard Word-to-PDF conversion, but if Cole's template was preprocessed or used a fixed embedded font, the code could be stable across documents. This requires verification against the template source file.
- **IronPDF pipeline for legacy document re-generation:** The presence of the Anne Riley IronPDF documents (27-CR-19-22615) with multi-megabyte PNG embeds may reflect a document conversion process in which older scanned documents were re-generated as PDFs at download time, with page scans stored as high-resolution PNG images. This would be a non-standard but technically possible archiving approach.
- **Amanda Burg template shared across DHS institutions:** The presence of Amanda Burg's signature and institutional logo in both AUTH_Amanda-Burg and AUTH_Megan-Larison-DHS documents may reflect a shared letterhead template used by both court liaisons at the Minnesota Security Hospital (Saint Peter) — a single institution where both evaluators work or worked.

APPENDIX | REPRODUCIBLE SQL QUERIES

All statistics in this report are reproducible from the following queries. Database: PostgreSQL (Supabase project ibfmjtwahkwqzcmeyqii). Connection: READ-ONLY. Queries marked SELECT-ONLY.

A1 — Anchor CTE (Cohort Definition — Identical to Parts 1 & 2)

```
-- NOTE: children_doc_set uses column 'value' (not 'doc_set')
WITH doc_set_cohort AS (
  SELECT
    cds.evidence_uid,
    cds.value AS doc_set,
    c.case_uid,
    c.cluster_id,
    c.cluster_name,
    c.filing_type,
    c.filing_date,
    c.case_type,
    c.filename,
    c.me_filename,
    c.doc_sha256
  FROM children_doc_set cds
  JOIN children c ON c.evidence_uid = cds.evidence_uid
  WHERE cds.value IN (
    'META_ESolutions-Signature',
    'META_Created-after-eFile',
    'META_MSIP',
    'META_Signed-after-eFile',
    'AUTH_Alisha-Nehring',
    'AUTH_Amanda-Burg',
    'AUTH_Judith-Cole',
    'AUTH_Megan-Larison-DHS'
  )
)
-- Cohort verification
SELECT COUNT(*) AS per_group_rows, COUNT(DISTINCT evidence_uid) AS unique_docs
FROM doc_set_cohort;
-- Expected: 1091 / 1043
```

A2 — Scout: children_objects Column Names

```
SELECT column_name, data_type
FROM information_schema.columns
WHERE table_name = 'children_objects'
ORDER BY ordinal_position;
```

A3 — Analysis 1: Object Inventory Per Group

```
WITH doc_set_cohort AS (
  SELECT cds.evidence_uid, cds.value AS doc_set
  FROM children_doc_set cds
  WHERE cds.value IN (
    'META_ESolutions-Signature','META_Created-after-eFile','META_MSIP',
    'META_Signed-after-eFile','AUTH_Alisha-Nehring','AUTH_Amanda-Burg',
    'AUTH_Judith-Cole','AUTH_Megan-Larison-DHS'
  )
),
obj_join AS (
  SELECT d.doc_set, d.evidence_uid, co.object_sha256, co.object_type,
         co.object_size_bytes
  FROM doc_set_cohort d
  LEFT JOIN children_objects co ON co.evidence_uid = d.evidence_uid
),
doc_obj_counts AS (
  SELECT doc_set, evidence_uid, COUNT(object_sha256) AS obj_count
  FROM obj_join GROUP BY doc_set, evidence_uid
)
SELECT
  doc_set,
  COUNT(DISTINCT evidence_uid) AS group_docs,
  SUM(CASE WHEN object_sha256 IS NOT NULL THEN 1 ELSE 0 END) AS total_objects,
  COUNT(DISTINCT object_sha256) AS distinct_sha256s,
  SUM(CASE WHEN object_sha256 IS NULL THEN 1 ELSE 0 END) AS zero_object_docs,
  ROUND(AVG(obj_count)::numeric,1) AS avg_obj_per_doc,
  PERCENTILE_CONT(0.5) WITHIN GROUP (ORDER BY obj_count) AS median_obj_per_doc,
  MIN(obj_count) AS min_obj, MAX(obj_count) AS max_obj
FROM obj_join LEFT JOIN doc_obj_counts USING (doc_set, evidence_uid)
GROUP BY doc_set ORDER BY doc_set;
```

A4 — Analysis 1b: Object Family Distribution Per Group

```
WITH doc_set_cohort AS (
  SELECT cds.evidence_uid, cds.value AS doc_set
  FROM children_doc_set cds
  WHERE cds.value IN (
    'META_ESolutions-Signature','META_Created-after-eFile','META_MSIP',
    'META_Signed-after-eFile','AUTH_Alisha-Nehring','AUTH_Amanda-Burg',
    'AUTH_Judith-Cole','AUTH_Megan-Larison-DHS'
  )
)
SELECT d.doc_set, co.object_family, COUNT(*) AS obj_count,
       COUNT(DISTINCT co.object_sha256) AS distinct_hashes,
       COUNT(DISTINCT d.evidence_uid) AS doc_count
FROM doc_set_cohort d
JOIN children_objects co ON co.evidence_uid = d.evidence_uid
GROUP BY d.doc_set, co.object_family
ORDER BY d.doc_set, obj_count DESC;
```

A5 — Analysis 2: Top 10 Object Hashes Per Group

```
WITH doc_set_cohort AS (
  SELECT cds.evidence_uid, cds.value AS doc_set
  FROM children_doc_set cds
  WHERE cds.value IN (
    'META_ESolutions-Signature','META_Created-after-eFile','META_MSIP',
    'META_Signed-after-eFile','AUTH_Alisha-Nehring','AUTH_Amanda-Burg',
    'AUTH_Judith-Cole','AUTH_Megan-Larison-DHS'
  )
),
group_sizes AS (
  SELECT doc_set, COUNT(DISTINCT evidence_uid) AS group_doc_count
  FROM doc_set_cohort GROUP BY doc_set
),
obj_per_group AS (
  SELECT d.doc_set, co.object_sha256, co.object_type, co.object_family,
         co.object_person_name, co.object_person_role, co.object_size_bytes,
         COUNT(DISTINCT d.evidence_uid) AS doc_count_in_group
  FROM doc_set_cohort d
  JOIN children_objects co ON co.evidence_uid = d.evidence_uid
  GROUP BY d.doc_set, co.object_sha256, co.object_type, co.object_family,
           co.object_person_name, co.object_person_role, co.object_size_bytes
),
ranked AS (
  SELECT *, ROW_NUMBER() OVER (PARTITION BY doc_set ORDER BY doc_count_in_group DESC) AS rn
  FROM obj_per_group
)
SELECT r.doc_set, r.rn, r.object_sha256, r.object_type, r.object_family,
       r.object_person_name, r.object_person_role, r.object_size_bytes,
       r.doc_count_in_group, gs.group_doc_count,
       ROUND(100.0 * r.doc_count_in_group / gs.group_doc_count, 1) AS pct_of_group
FROM ranked r
JOIN group_sizes gs ON gs.doc_set = r.doc_set
WHERE r.rn <= 10
ORDER BY r.doc_set, r.rn;
```

A6 — Analysis 2b: Group-Defining Objects (≥80% in-group, ≤5% corpus)

```
WITH doc_set_cohort AS (
  SELECT cds.evidence_uid, cds.value AS doc_set
  FROM children_doc_set cds
  WHERE cds.value IN (
    'META_ESolutions-Signature','META_Created-after-eFile','META_MSIP',
    'META_Signed-after-eFile','AUTH_Alisha-Nehring','AUTH_Amanda-Burg',
    'AUTH_Judith-Cole','AUTH_Megan-Larison-DHS'
  )
),
group_sizes AS (
  SELECT doc_set, COUNT(DISTINCT evidence_uid) AS group_n FROM doc_set_cohort GROUP BY
doc_set
),
obj_in_group AS (
  SELECT d.doc_set, co.object_sha256, co.object_type, co.object_family,
         co.object_person_name, co.object_size_bytes,
         COUNT(DISTINCT d.evidence_uid) AS in_group_docs
  FROM doc_set_cohort d
  JOIN children_objects co ON co.evidence_uid = d.evidence_uid
  GROUP BY d.doc_set, co.object_sha256, co.object_type, co.object_family,
           co.object_person_name, co.object_size_bytes
),
corpus_count AS (
  SELECT co.object_sha256, COUNT(DISTINCT co.evidence_uid) AS corpus_docs
  FROM children_objects co GROUP BY co.object_sha256
),
total_corpus AS (SELECT COUNT(DISTINCT evidence_uid) AS n FROM children)
SELECT g.doc_set, g.object_sha256, g.object_type, g.object_family,
       g.object_person_name, g.object_size_bytes,
       g.in_group_docs, gs.group_n,
       ROUND(100.0*g.in_group_docs/gs.group_n,1) AS pct_in_group,
       c.corpus_docs, tc.n AS total_docs,
       ROUND(100.0*c.corpus_docs/tc.n,2) AS pct_corpus
FROM obj_in_group g
JOIN group_sizes gs ON gs.doc_set = g.doc_set
JOIN corpus_count c ON c.object_sha256 = g.object_sha256
CROSS JOIN total_corpus tc
WHERE g.in_group_docs::numeric/gs.group_n >= 0.80
ORDER BY pct_in_group DESC;
```

A7 — Analysis 3: Cross-Group Jaccard Similarity Matrix

```
WITH doc_set_cohort AS (
  SELECT cds.evidence_uid, cds.value AS doc_set
  FROM children_doc_set cds
  WHERE cds.value IN (
    'META_ESolutions-Signature','META_Created-after-eFile','META_MSIP',
    'META_Signed-after-eFile','AUTH_Alisha-Nehring','AUTH_Amanda-Burg',
    'AUTH_Judith-Cole','AUTH_Megan-Larison-DHS'
  )
),
group_objects AS (
  SELECT DISTINCT d.doc_set, co.object_sha256
  FROM doc_set_cohort d
  JOIN children_objects co ON co.evidence_uid = d.evidence_uid
),
pairs AS (
  SELECT a.doc_set AS grp_a, b.doc_set AS grp_b,
    COUNT(CASE WHEN a.object_sha256 = b.object_sha256 THEN 1 END) AS intersection_count
  FROM group_objects a
  JOIN group_objects b ON b.doc_set >= a.doc_set
  GROUP BY a.doc_set, b.doc_set
),
group_sizes AS (
  SELECT doc_set, COUNT(DISTINCT object_sha256) AS set_size
  FROM group_objects GROUP BY doc_set
)
SELECT p.grp_a, p.grp_b, p.intersection_count,
  sa.set_size AS size_a, sb.set_size AS size_b,
  ROUND(p.intersection_count::numeric /
        (sa.set_size + sb.set_size - p.intersection_count), 4) AS jaccard
FROM pairs p
JOIN group_sizes sa ON sa.doc_set = p.grp_a
JOIN group_sizes sb ON sb.doc_set = p.grp_b
ORDER BY jaccard DESC;
```

A8 — Analysis 4: Font Analysis with Tracking Font Groups

```
WITH doc_set_cohort AS (
  SELECT cds.evidence_uid, cds.value AS doc_set
  FROM children_doc_set cds
  WHERE cds.value IN (
    'META_ESolutions-Signature','META_Created-after-eFile','META_MSIP',
    'META_Signed-after-eFile','AUTH_Alisha-Nehring','AUTH_Amanda-Burg',
    'AUTH_Judith-Cole','AUTH_Megan-Larison-DHS'
  )
)
-- Top fonts by doc_count across groups
SELECT co.object_sha256, co.object_type, co.object_size_bytes,
       co.object_font_name, co.object_font_code,
       COUNT(DISTINCT d.doc_set) AS group_count,
       COUNT(DISTINCT d.evidence_uid) AS doc_count,
       STRING_AGG(DISTINCT d.doc_set, ' | ' ORDER BY d.doc_set) AS groups
FROM doc_set_cohort d
JOIN children_objects co ON co.evidence_uid = d.evidence_uid
WHERE co.object_family = 'Font'
GROUP BY co.object_sha256, co.object_type, co.object_size_bytes,
         co.object_font_name, co.object_font_code
ORDER BY doc_count DESC LIMIT 25;
```

A9 — Analysis 5: Signature Object Distribution

```
WITH doc_set_cohort AS (
  SELECT cds.evidence_uid, cds.value AS doc_set
  FROM children_doc_set cds
  WHERE cds.value IN (
    'META_ESolutions-Signature','META_Created-after-eFile','META_MSIP',
    'META_Signed-after-eFile','AUTH_Alisha-Nehring','AUTH_Amanda-Burg',
    'AUTH_Judith-Cole','AUTH_Megan-Larison-DHS'
  )
)
SELECT d.doc_set,
  COUNT(DISTINCT CASE WHEN co.object_family='Judicial Officer Signature'
        THEN d.evidence_uid END) AS docs_with_jo_sig,
  COUNT(DISTINCT CASE WHEN co.object_family='Judicial Officer Signature'
        THEN co.object_person_name END) AS distinct_jo_persons,
  COUNT(DISTINCT CASE WHEN co.object_family='Signature'
        THEN d.evidence_uid END) AS docs_with_non_jo_sig,
  COUNT(DISTINCT CASE WHEN co.object_family='Signature'
        THEN co.object_person_name END) AS non_jo_persons
FROM doc_set_cohort d
JOIN children_objects co ON co.evidence_uid = d.evidence_uid
GROUP BY d.doc_set ORDER BY d.doc_set;
```

A10 — Analysis 6: Object Size Distribution Buckets

```
WITH doc_set_cohort AS (
  SELECT cds.evidence_uid, cds.value AS doc_set
  FROM children_doc_set cds
  WHERE cds.value IN (
    'META_ESolutions-Signature','META_Created-after-eFile','META_MSIP',
    'META_Signed-after-eFile','AUTH_Alisha-Nehring','AUTH_Amanda-Burg',
    'AUTH_Judith-Cole','AUTH_Megan-Larison-DHS'
  )
),
bucketed AS (
  SELECT d.doc_set,
    CASE
      WHEN co.object_size_bytes = 0     THEN '0 bytes'
      WHEN co.object_size_bytes <= 1024 THEN '1B-1KB'
      WHEN co.object_size_bytes <= 10240 THEN '1-10KB'
      WHEN co.object_size_bytes <= 102400 THEN '10-100KB'
      WHEN co.object_size_bytes <= 1048576 THEN '100KB-1MB'
      ELSE '>1MB'
    END AS size_bucket,
    CASE
      WHEN co.object_size_bytes = 0     THEN 1
      WHEN co.object_size_bytes <= 1024 THEN 2
      WHEN co.object_size_bytes <= 10240 THEN 3
      WHEN co.object_size_bytes <= 102400 THEN 4
      WHEN co.object_size_bytes <= 1048576 THEN 5
      ELSE 6
    END AS bucket_order
  FROM doc_set_cohort d
  JOIN children_objects co ON co.evidence_uid = d.evidence_uid
)
SELECT doc_set, size_bucket, bucket_order, COUNT(*) AS obj_count
FROM bucketed
GROUP BY doc_set, size_bucket, bucket_order
ORDER BY doc_set, bucket_order;
```

A11 — Analysis 6b: Objects >1 MB with Source Documents

```
WITH doc_set_cohort AS (
  SELECT cds.evidence_uid, cds.value AS doc_set, c.filename
  FROM children_doc_set cds
  JOIN children c ON c.evidence_uid = cds.evidence_uid
  WHERE cds.value IN (
    'META_ESolutions-Signature','META_Created-after-eFile','META_MSIP',
    'META_Signed-after-eFile','AUTH_Alisha-Nehring','AUTH_Amanda-Burg',
    'AUTH_Judith-Cole','AUTH_Megan-Larison-DHS'
  )
)
SELECT d.doc_set, d.filename, co.object_sha256, co.object_type,
       co.object_family, co.object_person_name, co.object_size_bytes,
       d.evidence_uid
FROM doc_set_cohort d
JOIN children_objects co ON co.evidence_uid = d.evidence_uid
WHERE co.object_size_bytes > 1048576
ORDER BY co.object_size_bytes DESC;
```

A12 — Tracking Font Groups in Cohort

```
WITH doc_set_cohort AS (
  SELECT cds.evidence_uid, cds.value AS doc_set
  FROM children_doc_set cds
  WHERE cds.value IN (
    'META_ESolutions-Signature','META_Created-after-eFile','META_MSIP',
    'META_Signed-after-eFile','AUTH_Alisha-Nehring','AUTH_Amanda-Burg',
    'AUTH_Judith-Cole','AUTH_Megan-Larison-DHS'
  )
)
SELECT ctg.font_group, ctg.pdf_group, ctg.font1_sha256, ctg.font1_name,
       ctg.font1_type,
       COUNT(DISTINCT d.doc_set) AS grp_count,
       COUNT(DISTINCT d.evidence_uid) AS doc_count,
       STRING_AGG(DISTINCT d.doc_set, ' | ' ORDER BY d.doc_set) AS groups
FROM doc_set_cohort d
JOIN children_tracking_groups ctg ON ctg.evidence_uid = d.evidence_uid
GROUP BY ctg.font_group, ctg.pdf_group, ctg.font1_sha256, ctg.font1_name,
         ctg.font1_type
ORDER BY doc_count DESC;
```

Provenance URLs: Object hashes can be retrieved at: *STORJ_OBJ + {object_sha256} + {object_type}* · Filenames: *STORJ_BIN + {filename}* · DB metadata: *STORJ_DB + {me_filename}*

Report prepared by: Matthew David Guertin, Pro Se Defendant

Case Reference: State of Minnesota v. Guertin | 27-CR-23-1886 | Fourth Judicial District Court, Hennepin County

Series: Doc-Set Group Forensics Part 3 of 5 | Embedded Object Forensics & Cross-Group Object Sharing

Data Source: Minnesota Court Records Online (MCRO) — Public Records | PostgreSQL Forensic Database

All findings reproducible from Appendix SQL queries. Bitcoin blockchain-anchored OTS timestamps and MITMPROXY session recordings constitute the primary evidence chain for data collection provenance.