



Environmental Analysis Program

Pomona College
Biogeochemistry Laboratory

SOP-L010

Laboratory Notebook Recording

Standard Operating Procedure

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1. Purpose

This SOP establishes the physical documentation standards for laboratory notebooks in the EA Program. A properly maintained notebook is a legal record that establishes what was done, when, by whom, and what was observed. These standards follow Good Documentation Practice (GDP) principles used in regulated laboratories and ensure that EA Program data are traceable, contemporaneous, and defensible (Kanare, 1985; U.S. Environmental Protection Agency, 2002).

This SOP covers *how* to record. For *what* to record during an analytical session, see [SOP-L802 Quality Control](#), Section 7.1. For field notebook protocols, see [SOP-F003 Field Notebook Protocols](#).

2. Scope

- **Applies to:** All laboratory work performed under EA Program SOPs, including sample preparation, instrument operation, calibration, data reduction, and reagent/standard preparation
- **Does not apply to:** Field notebooks (see [SOP-F003](#)) or purely electronic records in R scripts and Git (see [SOP-L801](#)), though electronic records should meet the same traceability standards (US Food and Drug Administration, 2004)
- **Location:** All EA Program laboratories (SGM 133, 134, 135)

3. Responsibilities

Role	Responsibility
Lab PI	Set documentation standards; review notebooks
Lab Manager	Issue notebooks; maintain archive; verify compliance
All Lab Personnel	Maintain a notebook per this SOP
New Students	Read this SOP before beginning any lab work

4. Definitions

- **Archival ink:** Ink formulated to resist fading, water, and chemical degradation over decades; required for all permanent laboratory notebook entries; ballpoint or pigment-based pens are preferred over roller-ball gel inks (Kanare, 1985).

- **Carbon-copy notebook:** A notebook with interleaved carbonless copy pages that produce a duplicate of each entry; the copy is torn out and stored separately as a backup, while the original remains bound in the notebook.
- **Contemporaneous record:** An entry made at the time the observation or action occurs, not reconstructed from memory afterward; the defining characteristic of a legally defensible laboratory record (Kanare, 1985).
- **GDP (Good Documentation Practice):** A set of principles for creating accurate, legible, contemporaneous, original, and attributable records; the foundation of data integrity in regulated and research laboratories (U.S. Environmental Protection Agency, 2002).
- **Single-strikethrough correction:** The required method for correcting an error in a laboratory notebook: draw a single line through the incorrect entry so it remains legible, write the correct entry nearby, and sign and date the correction; erasing or using white-out is prohibited (Kanare, 1985).
- **Table of Contents (TOC):** A running index of entries, maintained on the first 2 pages of every notebook, linking dates and topics to page numbers; enables rapid retrieval of specific entries.
- **Witness signature:** A second person's signature and date on a notebook entry confirming that they observed or reviewed the work; required for patent-related records and recommended for any significant observation.

5. Required Notebook Type

Use a bound, carbon-copy laboratory notebook with numbered pages (e.g., a 200-page carbonless copy notebook). Do not use spiral-bound notebooks, loose-leaf paper, or stapled pages as primary records. The carbon-copy notebook provides a built-in backup: the copy page is removed and stored separately, and the original remains permanently bound (Kanare, 1985).

Acceptable notebooks are available from the lab manager. Notify the lab manager when you are on the last 20 pages so a replacement can be ordered.

6. Setting Up a New Notebook

1. Write your name, contact information, the notebook serial number (if present), and the start date on the outside spine.
2. On the inside front cover, record: your name, contact information, project name, and the date the notebook was put into service.
3. Reserve the first two pages for a Table of Contents. Update the TOC as you fill the notebook.

7. Writing Instruments

7.1. Required

Write **all** entries in permanent, non-erasable ink (Kanare, 1985). Use a ballpoint pen that produces a clear impression on both the original and the carbon-copy page. Black or dark blue ink is preferred.

7.2. Not Permitted

- Pencil (can be erased)
- Gel ink or felt-tip pens that do not transfer reliably to the carbon copy
- Erasable ink pens

Tip

Test your pen on a spare carbon-copy page before starting a new notebook. Press firmly enough to produce a legible duplicate, but not so hard that you tear the paper.

8. Entry Formatting

8.1. Every Entry Begins With

At the top of each new entry (or new day), record:

1. **Date** in ISO format: YYYY-MM-DD (e.g., 2026-05-18)
2. **Your name** (or initials, if your full name is on the inside cover and you are the sole user)
3. **Purpose** of the work session in one sentence (e.g., “TOC-L calibration and K_2SO_4 extract analysis, Project: BFS Soils”)
4. **SOP(s) in use** with revision numbers

8.2. Contemporaneous Recording

Write entries **at the time the work is performed**, not from memory afterward (Kanare, 1985). If you record a result on a printout, sticky note, or scrap paper during an urgent moment, tape or staple the original into the notebook and initial and date it at the earliest opportunity. Never discard the original note.

8.3. Level of Detail

Write enough detail so that another trained researcher could reproduce your work using only the notebook and the referenced SOP. At minimum, include all items listed in [SOP-L802, Section 7.1](#) (U.S. Environmental Protection Agency, 2002).

8.4. Printouts, Graphs, and Attachments

Tape or staple instrument printouts, chromatograms, calibration reports, or other documents directly into the notebook. Write across the border of the attachment and the notebook page so that it is clear the attachment was placed at that time. Initial and date each attachment.

8.5. Tables and Calculations

- Draw tables with a ruler if practical.
- Show all calculations, including units and intermediate steps, so that results can be verified.
- Circle or box final results for easy identification.

8.6. Blank Space and Unused Pages

- Do not leave large blank areas within an entry. If you finish an entry partway down a page, draw a diagonal line through the remaining blank space and initial and date it. This prevents later additions.
- Never skip pages. If you accidentally skip a page, draw a diagonal line through it, write “INTENTIONALLY LEFT BLANK,” and initial and date it (Kanare, 1985).

9. Error Correction

If you make a mistake in the notebook (Kanare, 1985):

1. Draw a **single horizontal line** through the incorrect text so it remains legible.
2. Write the correct information directly above, below, or beside the crossed-out entry.
3. Write your initials and the date next to the correction.
4. If the error is extensive (e.g., an entire wrong entry), strike through the full section, write “Error – see page XX,” and rewrite the correct entry on the next available page.

! Prohibited Correction Methods

- White-out, correction tape, or liquid paper
- Erasing or scratching out (even when using pencil)
- Tearing out or cutting out pages
- Writing over an existing entry

Any of these actions raises data integrity concerns and may invalidate the record (Kanare, 1985).

10. Electronic Data References

When analysis is performed electronically (R scripts, instrument software, spreadsheets), record in the notebook:

- The name and location of the electronic file (e.g., full file path or GitHub repository URL)
- The date and time the file was created or the analysis was run
- The software version or R version used

Cross-referencing electronic records ensures that the notebook and the digital record are linked and neither stands alone (U.S. Environmental Protection Agency, 2002; US Food and Drug Administration, 2004).

11. Carbon-Copy Management

1. After completing each session, remove the carbon-copy page.
2. Review the copy for legibility. If the copy is not readable, note this on the original and on the copy.
3. Place the copy in the project's designated folder on the lab shared drive or in the physical project file.
4. The original stays bound in the notebook permanently.

12. Signature and Witness

- Sign and date each entry when you complete it.
- If your work produces a significant new observation or result (a new datum, a method validation, a reproducibility test), have a witness (a labmate or the PI) sign and date the entry as well.
- For IP-sensitive work, all entries should be witnessed at the time of writing, not retroactively.

13. Carbon Copy Storage and Notebook Archiving

13.1. Carbon Copies

File carbon copies chronologically in the project file within 48 hours of each session. Label the folder clearly with the project name, PI, and date range.

13.2. Full Notebooks

When a notebook is full:

1. Record the completion date on the outside spine.
2. Update the Table of Contents on the first two pages.
3. File the completed notebook in the **Notebook Archive** (SGM 133, labeled shelf), organized by project and date.
4. Update the Notebook Registry spreadsheet with the completion date.
5. Notebooks are retained for a minimum of **7 years** after the end of the associated project, or longer if required by a funding agency, IRB, or regulatory body.
6. Notebooks are the property of the EA Program and Pomona College. They must not be taken home, discarded, or removed from the archive without PI approval (Kanare, 1985).

14. Common Mistakes

Mistake	Consequence
Using pencil	Entries can be erased; not a permanent record

Mistake	Consequence
Recording data on scratch paper first	Scratch paper gets lost; transcription adds errors
Leaving entries unsigned	Cannot confirm who performed the work
Leaving blank space without striking through	Appearance that data could be inserted later
Using white-out or scribbling over errors	Raises data integrity concerns
Not removing carbon-copy duplicates	Backup is only useful if stored separately
Forgetting to reference electronic files	Data become disconnected from context
Skipping the Table of Contents	Information is hard to locate later

15. References

- Kanare (1985)
- U.S. Environmental Protection Agency (2002)
- US Food and Drug Administration (2004)

Kanare, H. M. (1985). *Writing the laboratory notebook*. American Chemical Society.

U.S. Environmental Protection Agency. (2002). *Guidance for quality assurance project plans (EPA QA/G-5)* (EPA/240/R-02/009). U.S. Environmental Protection Agency. <https://www.epa.gov/sites/default/files/2015-06/documents/g5-final.pdf>

US Food and Drug Administration. (2004). *Guidance for industry: Part 11, electronic records; electronic signatures – scope and application*. US FDA.

16. Related SOPs

SOP	Title	Relationship
L002	Laboratory Safety	Training documentation forms
L801	RStudio Server and GitHub	Electronic data management
L802	Quality Control and QA	What to record (Section 7.1)
F003	Field Notebook Protocols	Field counterpart

17. Training Record

Before beginning independent laboratory work, all personnel must:

1. Read this SOP in full
2. Set up a new notebook correctly (inside cover, Table of Contents, registry entry)
3. Demonstrate a properly formatted entry including: header, data recording, attached printout, error correction, blank-space management, and signature
4. Be signed off by the lab manager or PI