

Environmental Sciences Research Laboratory Sample Analysis Procedures

The Environmental Sciences Research Laboratory houses multiple instruments for the analysis of gases, liquids, and solids. The lab is available to ENSC students, faculty, and staff and is managed by David Lyons (ESRL Coordinator), who oversees and maintains instrumentation and the analysis of samples. The ESRL Coordinator is available to perform major and trace element analysis of soils and water for both on-campus and off-campus researchers, schedule analyses to meet deadlines, and develop instrument analytical methods.

Samples can be analyzed in two ways: **A)** department members who have been trained to use the instruments can schedule instrument time to process their own samples; or **B)** samples can be submitted for analysis by the ESRL Coordinator who will add them to a queue.

ESRL hours of operation: Mon-Fri 7am-4pm. Instruments can be used outside of these hours after communicating with the ESRL Coordinator.

Procedures for analyzing samples:

1. Decide whether you are:

A. Analyzing your own samples

B. Adding samples to a queue to be analyzed by the ESRL Coordinator. Please communicate with the ESRL Coordinator to determine how long it may take to process your samples, as the ESRL Coordinator may be processing samples for other customers or completing higher-priority tasks (e.g., instrument repairs).

A. Analyzing your own samples:

1. Communicate with the ESRL coordinator to reserve instrument time on the ESRL calendar (physical copy of calendar available in the ESRL).
2. Discuss with the ESRL Coordinator how much assistance and resources you will need for the scheduled run (Please use the example table below to communicate your needs to the ESRL Coordinator; e.g., preparation of fresh reagents, standards, etc.)
 - a. *First-time users:* communicate your instrument training needs with the ESRL Coordinator and schedule enough time for training and sample processing.
 - b. *Frequent users:* communicate whether you need standards prepared by the ESRL Coordinator before running samples (some users may choose to make their own). Ask ESRL Coordinator to make sure all required reagents are fresh and available.
3. The ESRL has many sensitive instruments that can malfunction if not used properly. Please schedule training before attempting to use instruments without help from the ESRL Coordinator. **The cost of repairs resulting from inadequate training and/or misuse of any instruments within the ESRL will be the sole responsibility of the PI.**
4. After running samples, please clean the workspace for the next user, transfer waste to containers supplied by the ESRL Coordinator, and let the ESRL Coordinator know you have finished using the instrument. Review data and quality control checks with the ESRL Coordinator and decide whether your run was successful.

B. Having samples analyzed by the ESRL Coordinator:

1. Communicate with the ESRL Coordinator how many samples need to be analyzed, your timeline, and when/how to supply your samples.
 - a. Label samples with unique identifier and then incrementally from 1 to n to simplify processing by the ESRL Coordinator.
2. Samples analyzed by the ESRL Coordinator will go into a queue. Since the ESRL coordinator will prioritize instrument repairs, samples from customer contracts, and training new users over processing “in-house” (ENSC-specific) samples, it is critical to communicate deadlines with the ESRL coordinator as shown in the third row in the example table below. Turn-around times for analytical results will vary depending on many factors (sample size, instrument availability, etc.) so it is important to coordinate with the ESRL Coordinator about meeting deadlines.
 - a. If the ESRL Coordinator cannot meet a deadline, the ESRL Coordinator will communicate with you via email with a new timeline.
3. Results for your analytical run will be sent by the ESRL Coordinator via email. Unless otherwise specified and communicated to the ESRL Coordinator, expect to receive a report as shown on the ESRL sample data products sheet, including a predetermined number of standards and quality control checks (i.e., 5 point calibration curve, and check standards, blanks, and sample duplicates processed every 10 unknowns).

What you can expect from the ESRL:

The ESRL Coordinator is available to assist conducting quality control and quality assurance assessments to ensure that analytical results are accurate. The ESRL stocks standard reference materials for all instruments as well as reagents for analytical methods. Some reagents require frequent preparation as they expire over time. Please coordinate the need for these reagents and their supply by the ESRL Coordinator as you schedule runs using the example table below:

Scheduled date and time	Instrument	# of samples	Analytes of interest	Who is running samples?	Requests for ESRL Coordinator
Oct 12, 9 am	AQ2	35	NH ₄ ⁺ and NO ₃ ⁻	Myself	Fresh working reagents; Cd coil maintenance; fresh working standards
Jan 13, 10 am	TOC	40	C and N	Myself	Warm-up instrument 1h ahead; urea standard
Dec 2, 9 am	AQ2	150	NH ₄ ⁺ and NO ₃ ⁻	ESRL Coordinator	Please add to queue; data needed in 3 weeks: day/month/year

The ESRL recognizes that your data is valuable. Analytical procedures and/or processing of sample data may take longer than expected due to increased volume of sample influx, instrument maintenance, supply-chain delays, or other circumstances that may arise, so planning ahead for data deadlines is critical. Every effort will be made to accommodate your research needs.

Fillable Sample Table:

Scheduled date and time	Instrument	# of samples	Analytes of interest	Who is running samples?	Requests for ESRL Coordinator