National Laboratory of the Rockies

Energy Materials and Processing at Scale Facility

The Energy Materials and Processing at Scale facility (EMAPS) accelerates the scale-up of laboratory innovations into market-relevant technologies and processes for critical minerals and electronic and functional energy materials.

Opening in late 2027, EMAPS will help enable a new technology scale-up model based on automated, AI-driven workflows and a “compute-first” approach. Reconfigurable lab spaces capable of high-hazard work and a flexible operational model make collaboration in EMAPS easy and impactful.

In alignment with the priorities of the U.S. Department of Energy Office of Critical Minerals and Energy Innovation, the National Laboratory of the Rockies (NLR) is seeking industrial, academic, and federal partners to collaborate in EMAPS on scale-up and de-risking in the following research areas:

- **Critical minerals upstream and midstream processing**, particularly by pyrometallurgy, molten salts, and electrochemical processing
- **Electronic and functional materials**, especially photovoltaics, semiconductors, batteries, and power electronics, and critical minerals processing for these materials
- **Membranes and thin films** for separations for critical mineral applications and industrial processes
- **Recycling** of complex heterogeneous feedstocks, including e-waste, scrap, batteries, and composites
- **Bioprocessing innovation** for cell-free manufacturing processes, protein synthesis, and bioseparations for critical minerals
- **Standards and materials validation** to facilitate market uptake of new sources of critical minerals.

Key Facility Specifications

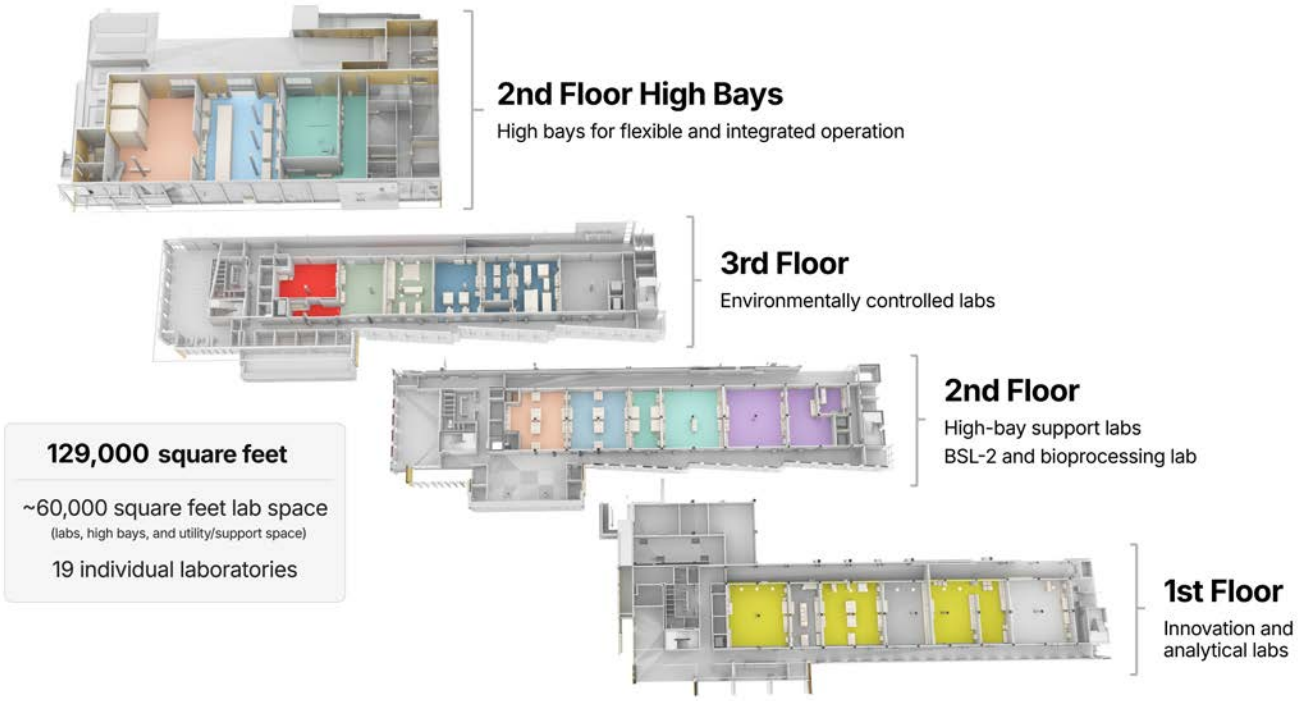
EMAPS spans 129,000 square feet, with 60,000 square feet of laboratory space across 19 individual laboratories and high bays.

Three two-story, pilot-scale high bays that feature rapidly reconfigurable and modular operation allow partners to quickly insert and remove skids and other equipment.

A dry room, a clean room, and humidity-controlled labs support battery, power electronics, and semiconductor scale-up work.

Biosafety level 2 (BSL-2) laboratories permit handling of moderate-risk organisms for innovative bioprocess scale-up.

EMAPS has significant power, ventilation, and other lab utilities designed to support research and development at scale. The building’s robust safety/permitting envelope enables high-hazard work.



The high bays and three floors of laboratory space in EMAPS will support a range of capabilities with infrastructure to manage a diverse hazard portfolio needed in scale-up work. *Model by Josh Bauer, National Laboratory of the Rockies*

Accelerated Scale-Up at EMAPS

Market-Focused Scale-Up—Work alongside NLR's process development and energy technology experts to co-develop processes and scale-up prototypes, assisted by the latest generation of manufacturing tools, robotics, engineering models, and systems-based multidisciplinary analysis.

Embedded Partner Model—Access dedicated floor space for partner equipment. The high bays feature integrated bridge cranes, large roll-up doors, and reinforced flooring to easily handle heavy industrial skids and other large equipment.

Accelerated Project Kickoffs—Make use of a flexible operational model and pre-established safety frameworks and engineered controls to allow the quick start of diverse high-hazard, pilot-scale activities.

Compute-First AI Platform—Harness AI, machine learning, digital twins, high-performance computing, and edge computing to facilitate decision-making and fast iteration. In time, NLR aims to deploy closed-loop autonomous experimentation capabilities in EMAPS.

Streamlined Mechanisms To Foster Collaboration and Secure Intellectual Property—Safeguard intellectual property and data with NLR partnership models and agreement mechanisms, while promoting sharing across value-added, multi-institution partnerships.

Focus on Equipment Manufacturing—Engage with original equipment manufacturers to seamlessly integrate new tools and metrology into your pilot operations.

Partner in EMAPS

General Questions:
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Cover Image: *Rendering from Smith Group*

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The National Laboratory of the Rockies is a national laboratory of the U.S. Department of Energy, Office of Critical Minerals and Energy Innovation, operated under Contract No. DE-AC36-08GO28308.

NLR/FS-6A42-101966 • September 2026