



A detailed geological map of the study area, showing various geological units and faults. The map includes labels for units such as Qaf, Ms, Tcv, Qls, Toes, DSOs, R, Qg, Qa, Lost, QTs, and GZs. It also shows the location of the Borok River and the Little River. The map is color-coded to represent different geological formations, with a legend provided in the bottom right corner.

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208 885 7479

@ the Federalism Committee, Idaho Falls, 9/28/2026



Mineral exploration and missed? opportunities in eastern Idaho & beyond

Claudio Berti

Director and State Geologist

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@ the Federalism Committee, Idaho Falls, 9/28/2026

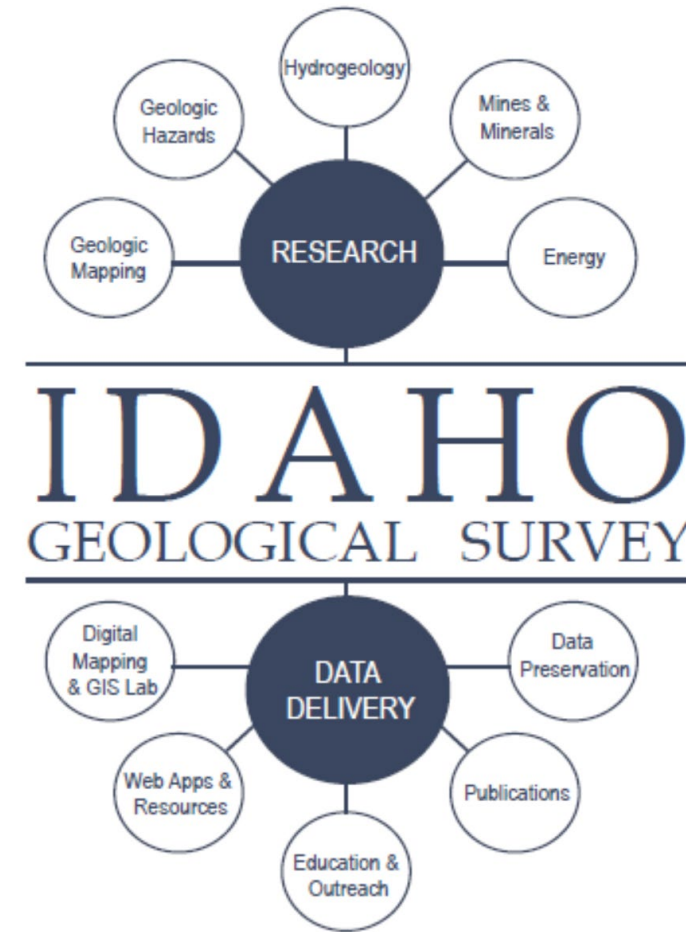


The Idaho Geological Survey (IGS) is the **lead state agency** for the collection, interpretation, and dissemination of geologic and mineral data for Idaho.
[Statutory Authority: Section 47-201, Idaho Code, et seq.]

IGS fulfill this mission through applied geologic research and strong collaborations with federal and state agencies, academia, the private sector, and the public.

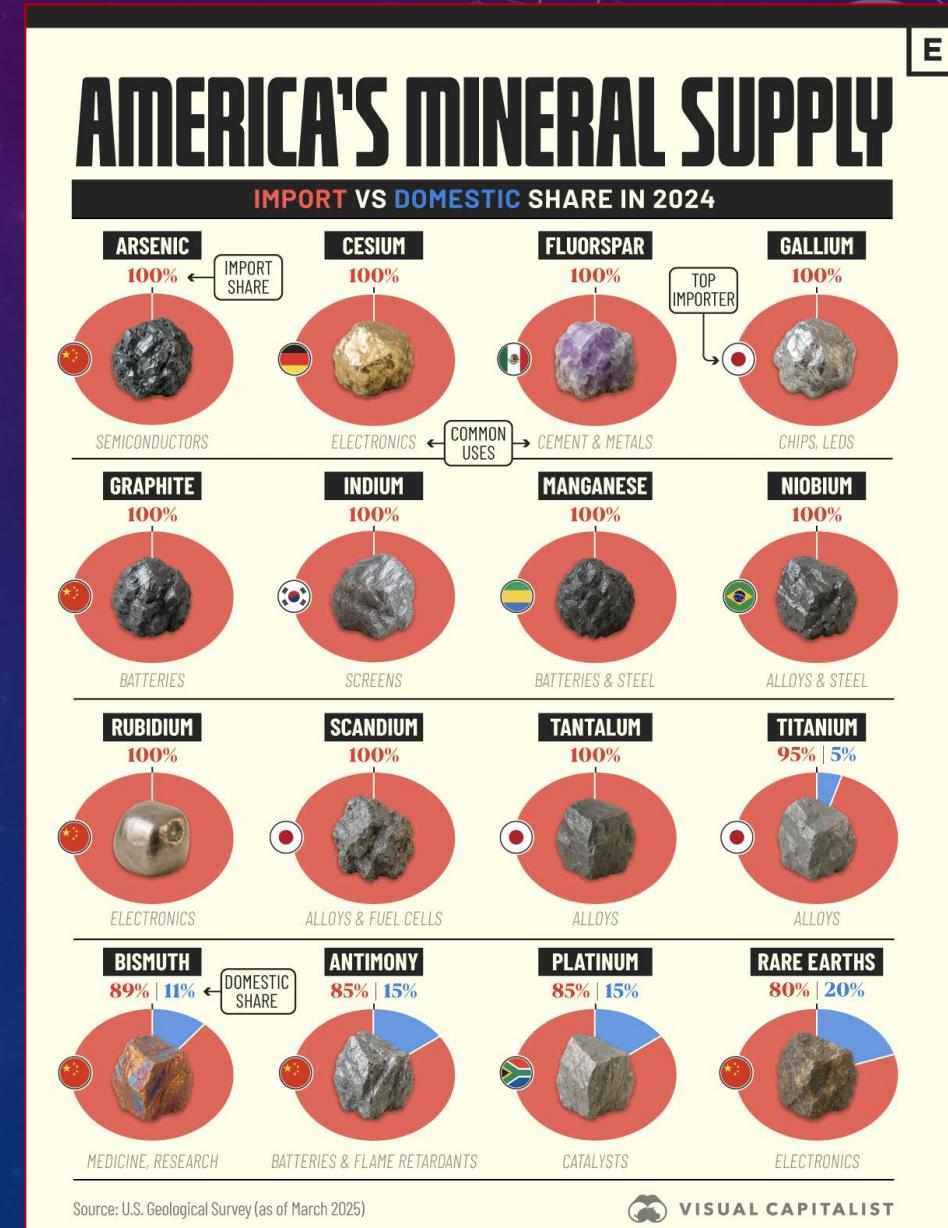
IGS is administered as a Special Program at the University of Idaho within the Office of Research and Economic Development (ORED).

IGS is a **non-regulatory agency**.



2025 HIGHLIGHTS: IDAHO'S MINERAL INDUSTRY

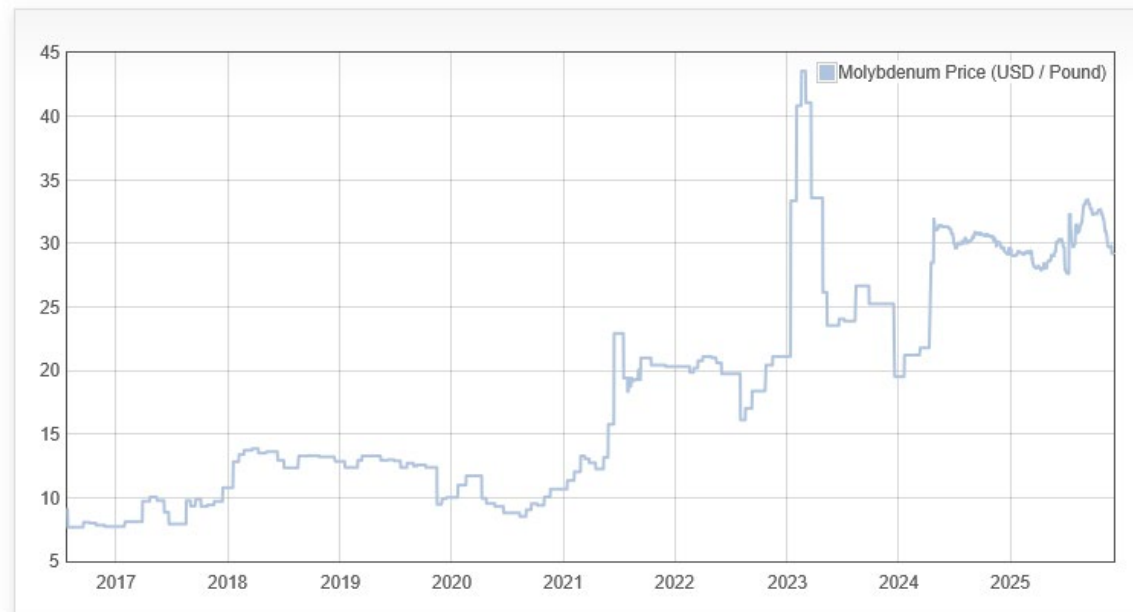
- Stibnite EIS Approved; construction started
- Caldwell Canyon mine: new EIS approved
- Phosphate rolls on: N Dry Ridge startup
- Hercules Metals: more drilling for Cu
- Operating Mines doing well
- Politics, Politics, Politics – Federal Shutdowns and Decrees
- **Critical Minerals and more Critical Minerals**
 - (Aren't they all?)
 - GeoPolitics and Foreign Competitors
 - Economics??????????????
- Ag @ \$ 58/troy ounce!!
- Au @ \$ 4200/troy ounce!!
 - (12/3/2025 spot)



MAJOR METAL PRICES



Molybdenum Prices for the Last 10 Years



Link directly to this result here: <http://www.dailymetalprice.com/metalpricecharts.php?c=mo&u=lb&d=2400>

Spot Prices: 11/2024 vs. 12/2025

Au: \$ 2672/ tr.oz. vs. \$ 4200

Ag: \$ 30.89/ tr.oz. vs. \$ 58

Cu: \$ 4.10/ lb. vs. \$ 5.30

Mo: \$ 30.07/ lb. ~ same ; Co at \$ 22/lb. today

ANTIMONY

USD/KG

Sb prices big rise starting in 2024.

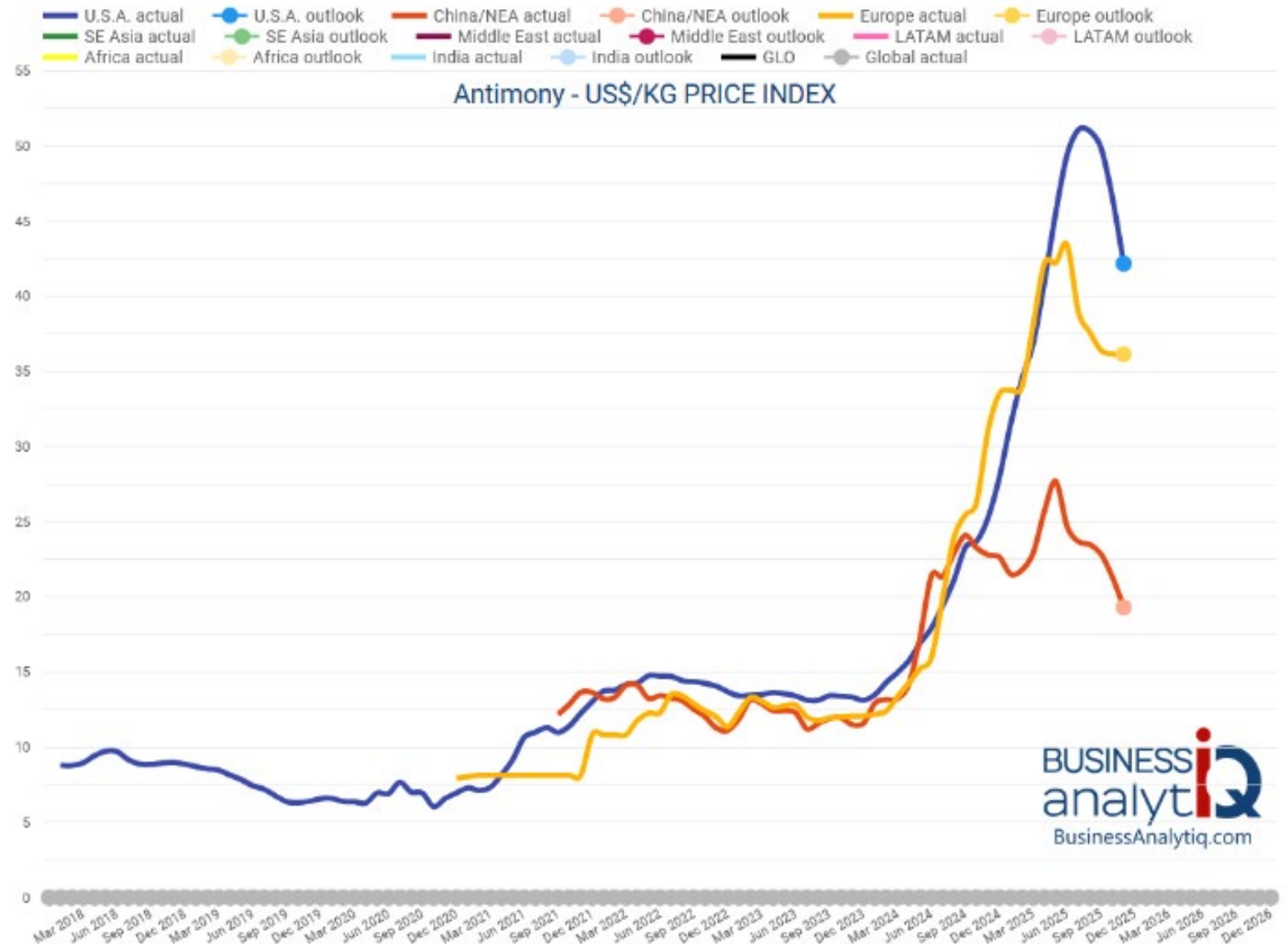
Decrease in 3rd Qtr. 2025.

Critical Mineral on all lists.
Flame retardants, lead-acid
batteries, military ammunition

Geopolitical concerns as China
dominates production,
reserves. 12/2024 – China
export ban.

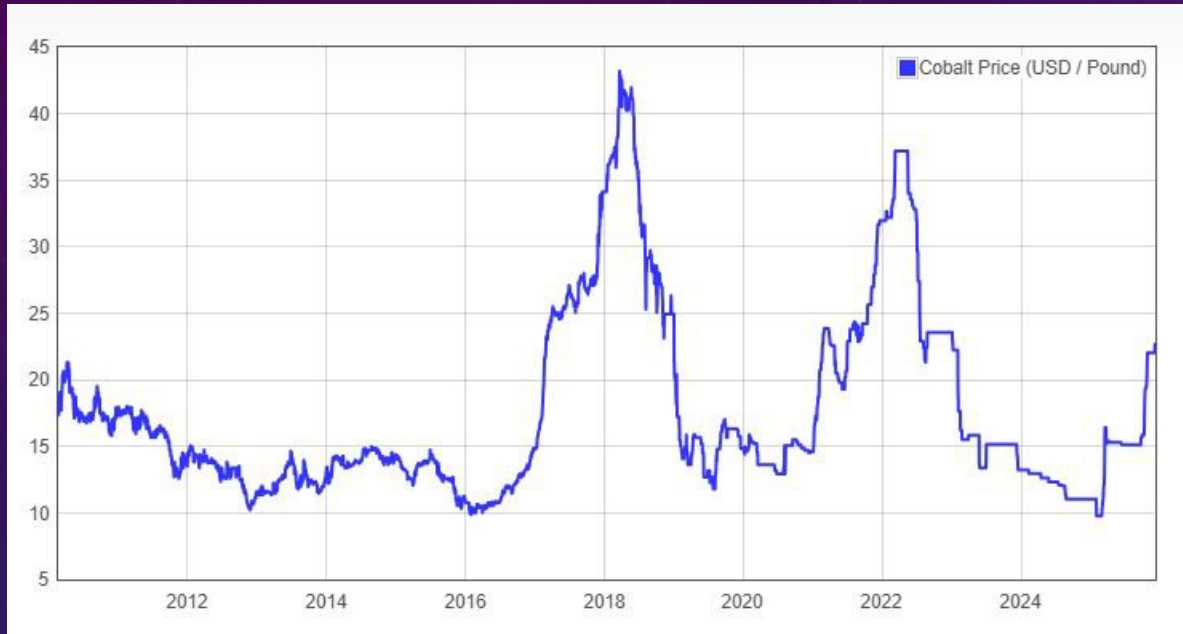
Idaho has many polymetallic
deposits that contain Sb.

The chart below summarizes Antimony price trend per region, as well as the outlook. It takes a moment to load.



IDAHO COBALT BELT: 2025 UPDATE

VERY QUIET



Dailymetalprice.com

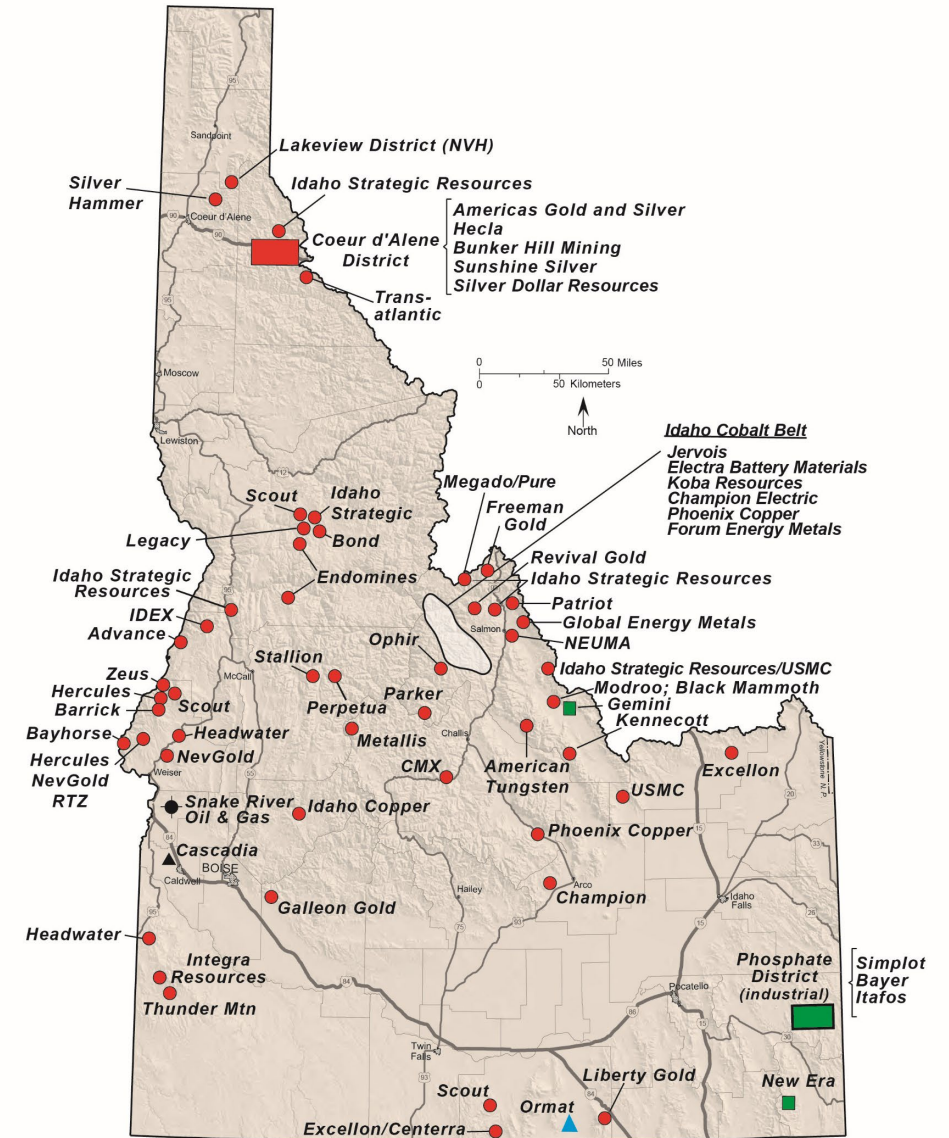
- **Jervois ICO (Idaho Cobalt Operations)**
- 2024: care and maintenance
- 2025 January: Jervois Global Commenced Ch. 11 Bankruptcy Proceedings (US, Australia)
- May 2025: New Jervois emerged as investor-led group with Brazil refinery asset and others
- ICO under “NewCo”. Facilities in long-term care and maintenance

Electra Battery Materials

- Holding Iron Creek Project
- Minimal exploration, processing studies
- Focus and Progress at Ontario refinery project

IDAHO EXPLORATION 2025

- Silver Valley Development & Exploration:
 - Bunker Hill, Sunshine, Murray Gold (already described)
- Critical Minerals: REEs, Cu, Sb, Zn, W
 - Lemhi County REE Trend
 - Ima mine (American Tungsten)
 - 2025 Update to US Critical Mineral List
- Gold Projects Moving to Permitting
 - Stibnite (Perpetua) – Approved and In Development
 - Black Pine (Liberty)
 - DeLamar (Integra)
- Stibnite EIS Approved; Construction underway
- Drilling and Consolidation in Western Idaho Cu Belt
- Federal and State Politics and Budget Cuts
- High Au, Ag prices



EXPLORATION 2024-2025



ALL THE METALS WE MINED

IN 2021

The world produced roughly **2.8 billion tonnes** of metals in 2021. Here are all the metals we mined, visualized on the same scale.

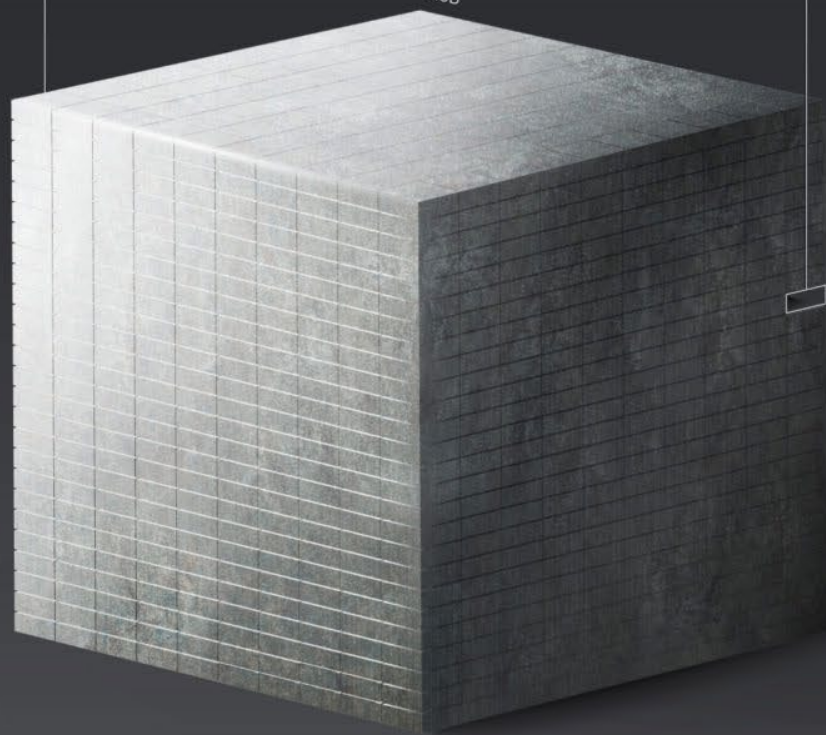
IRON ORE

2,600,000,000 tonnes*



= 1,000,000 tonnes

Iron Ore*
2.6B



LARGEST END-USE



Steelmaking



Construction



Chemicals



Alloying Agents



Energy/Batteries



Magnets



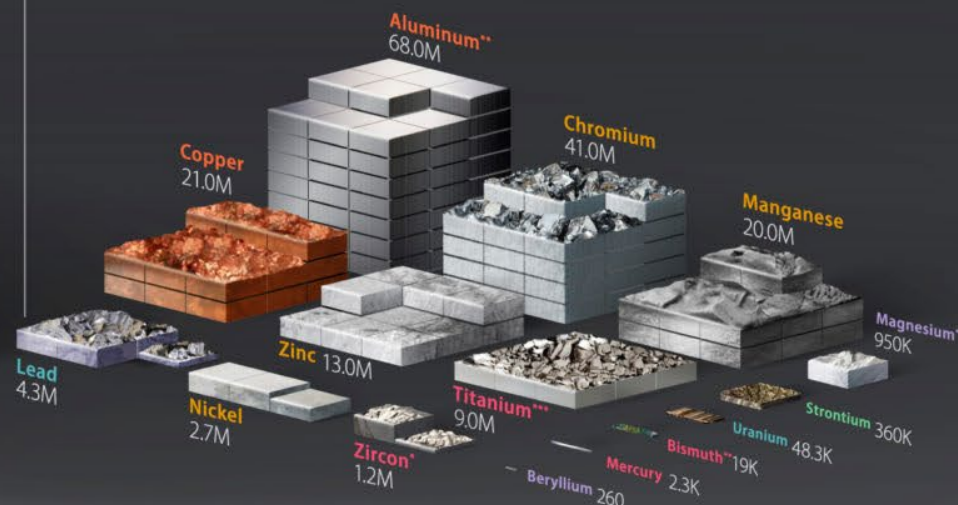
Electronics



Other

INDUSTRIAL METALS

181,579,892 tonnes

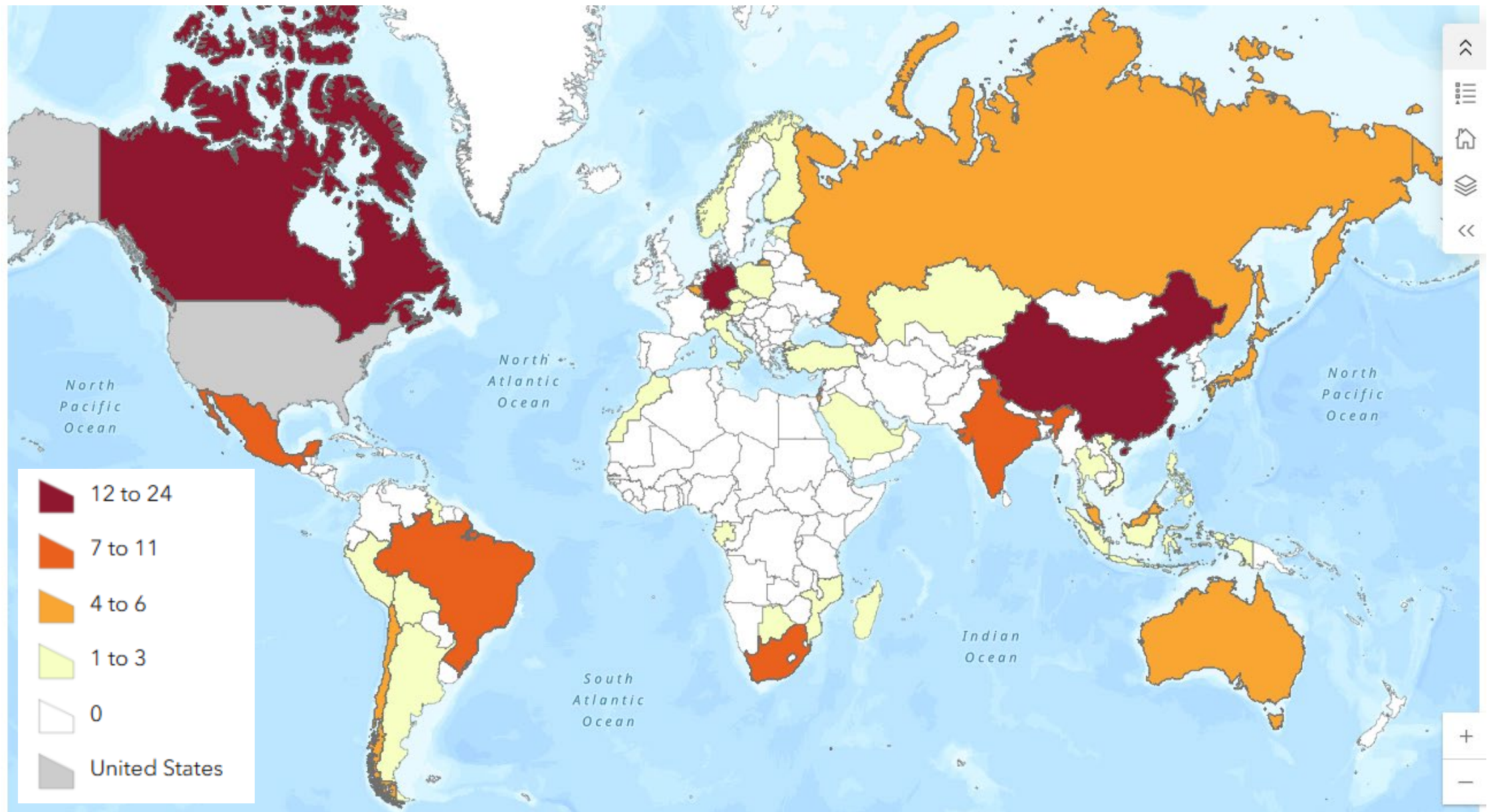


TECHNOLOGY AND PRECIOUS METALS

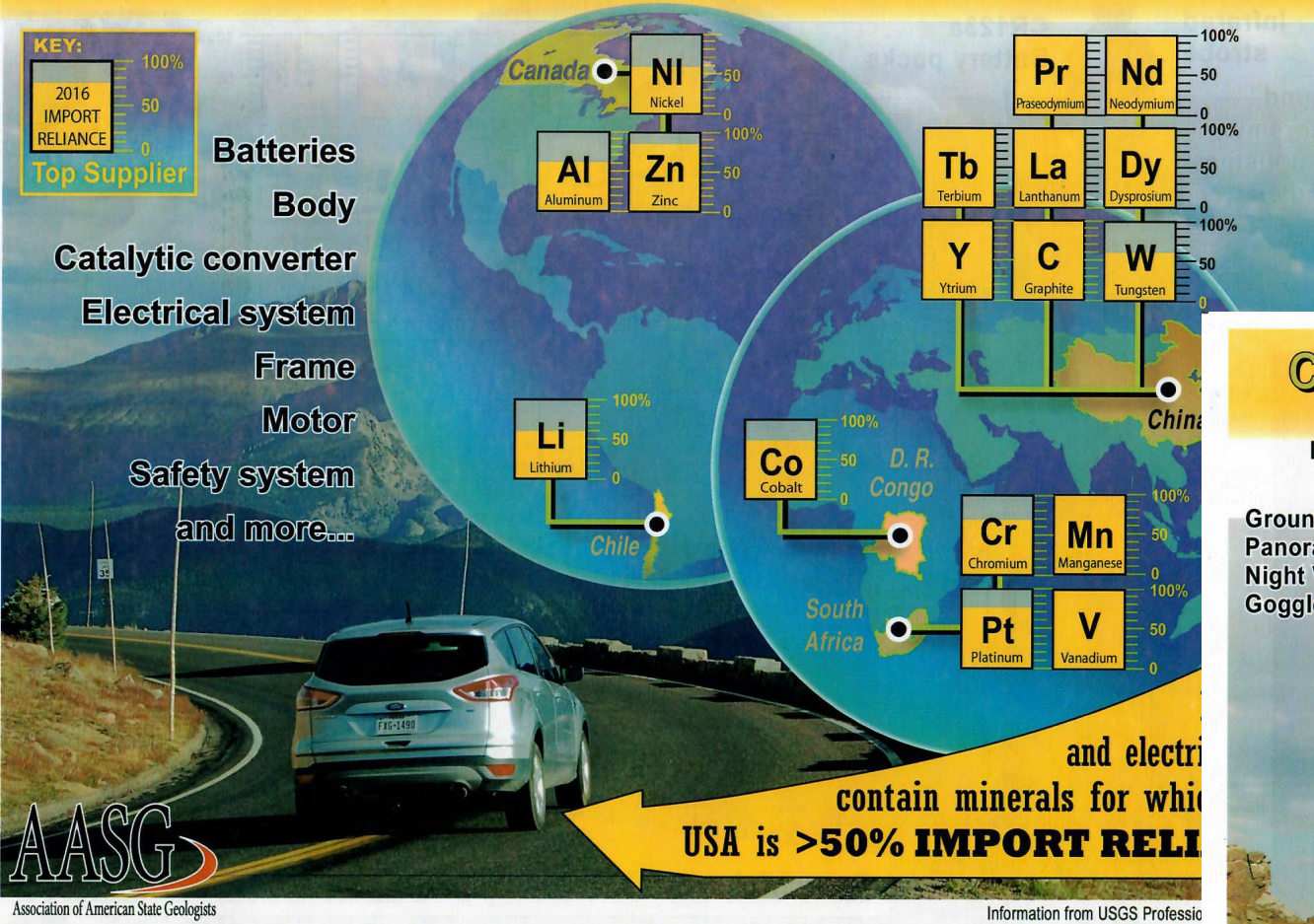
1,474,889 tonnes



Major Import Sources of Nonfuel Mineral Commodities for Which the United States was Greater Than 50% Net Import Reliant in 2025

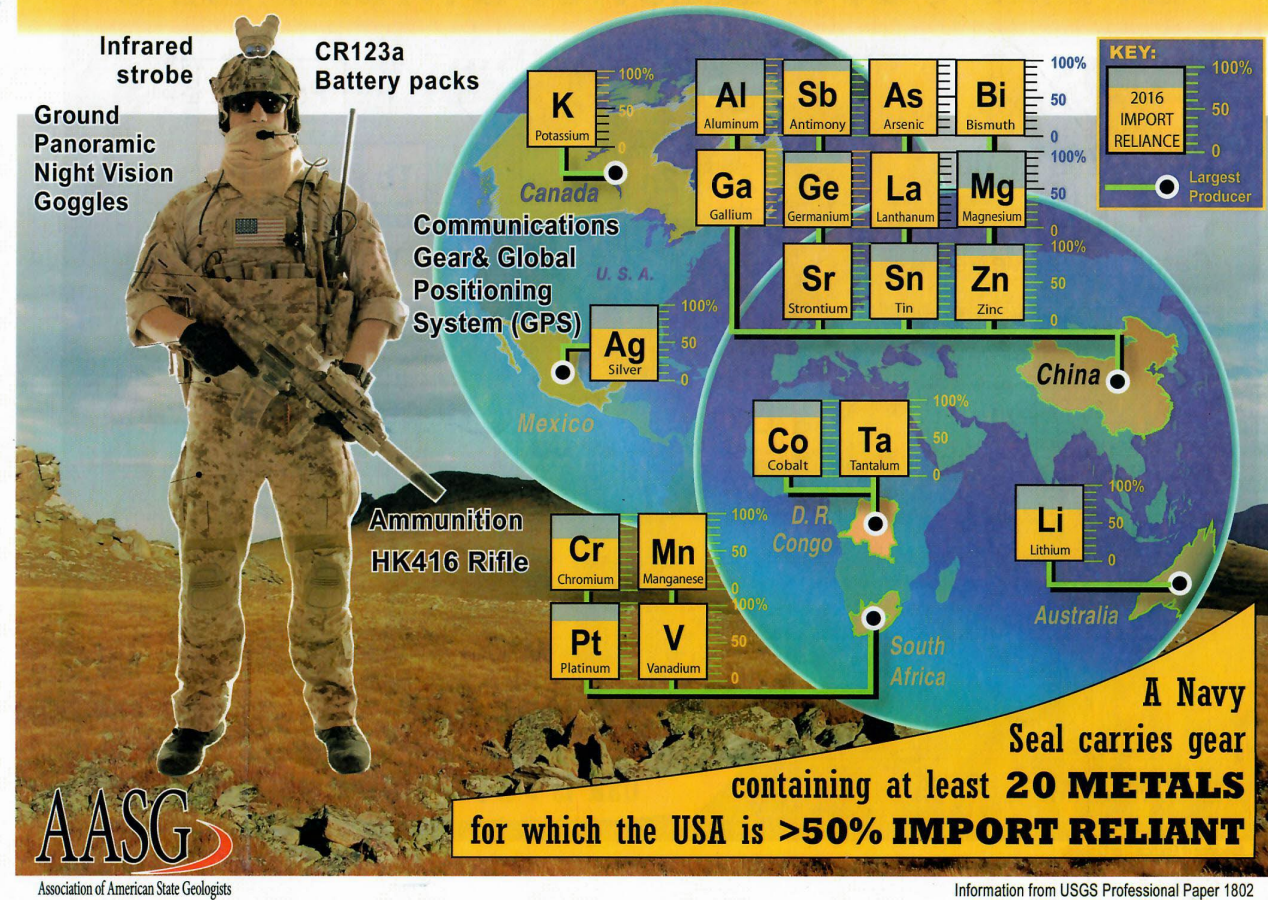


KEY MINERALS IN ELECTRIC & HYBRID CARS



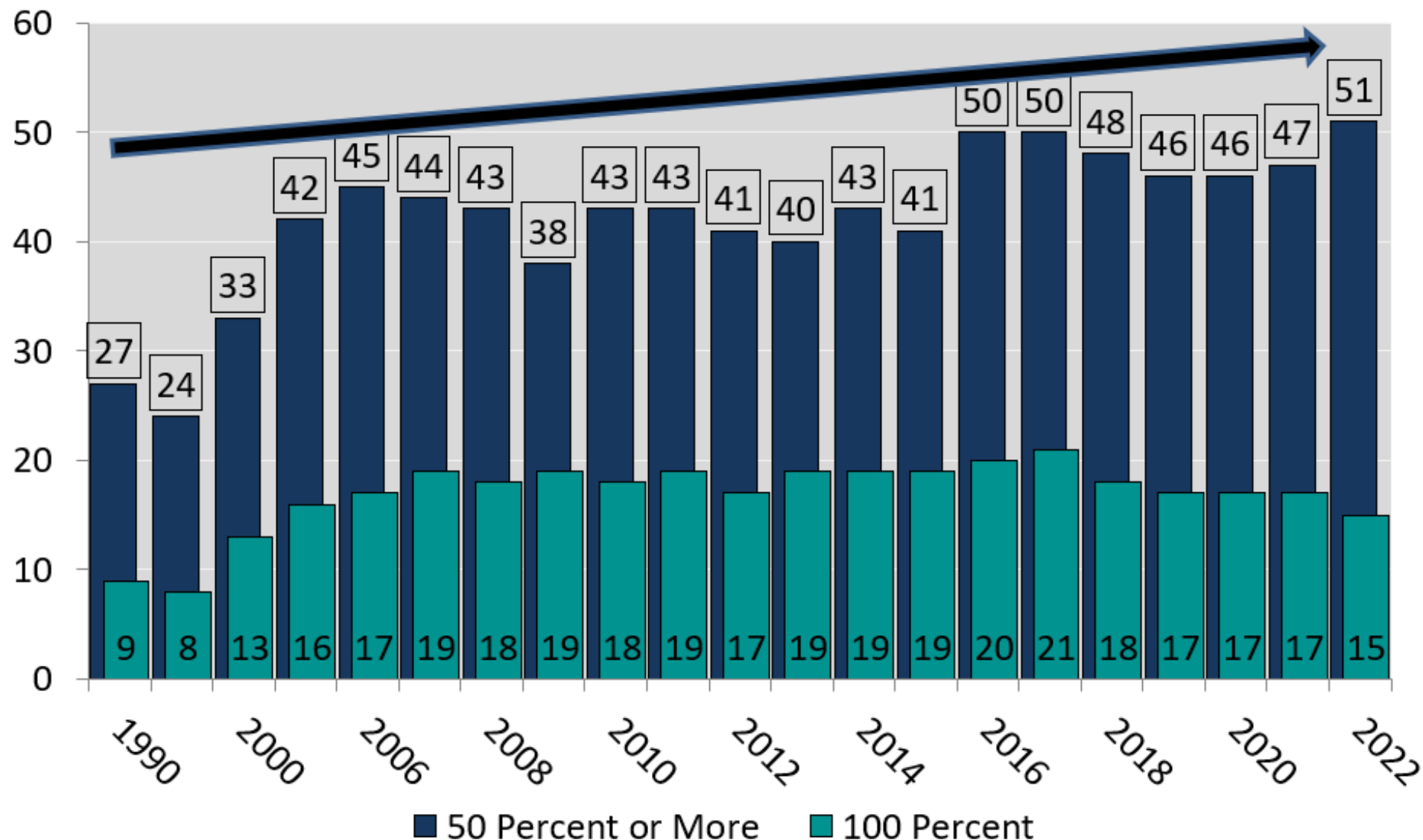
AASG
 Association of American State Geologists

CRITICAL METALS IN SPECIAL FORCES GEAR



AASG
 Association of American State Geologists

U.S. Mineral Import Reliance



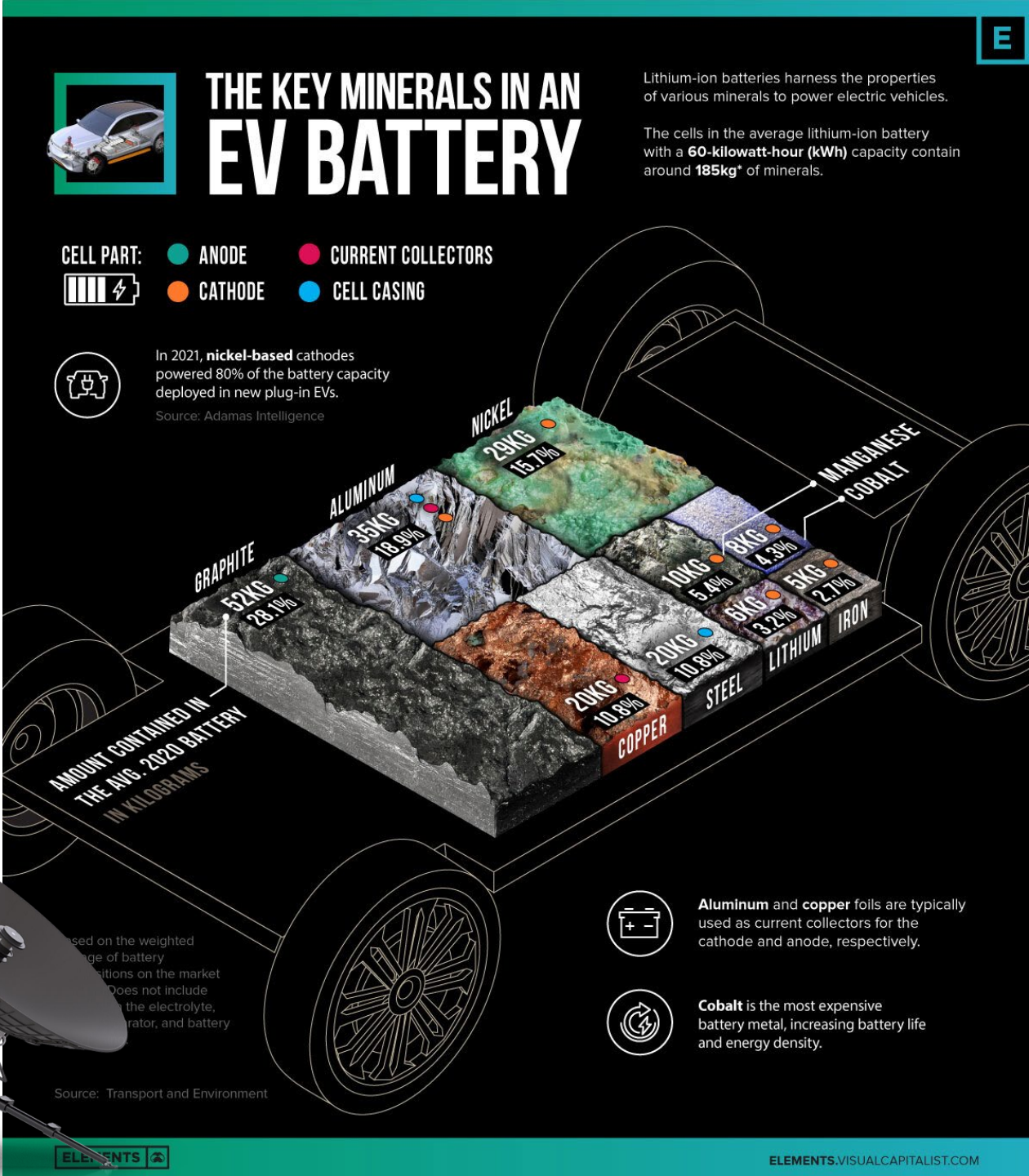
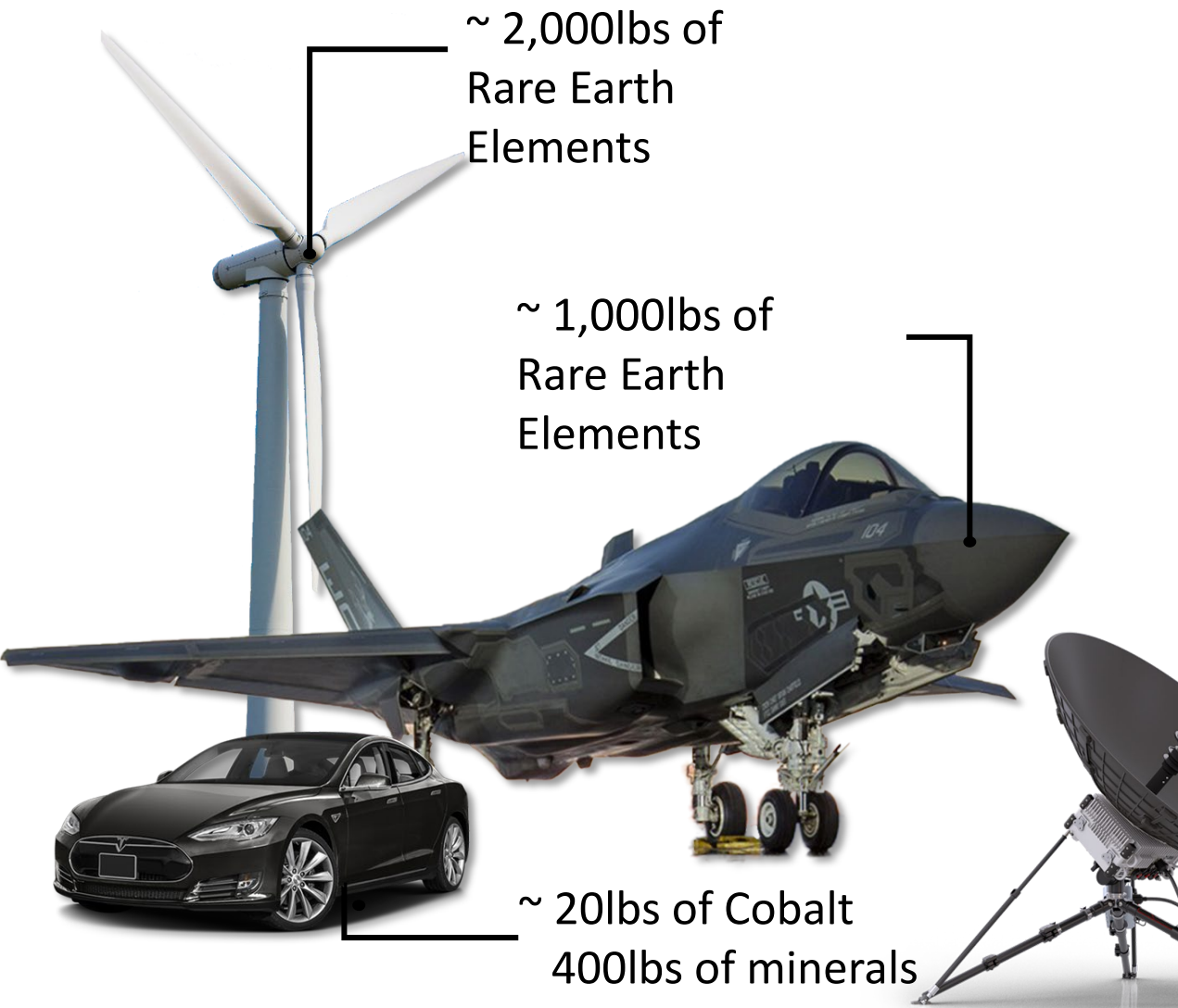
Source: USGS Mineral Commodity Summaries 1990-2023 editions

The Energy Act of 2020 defines a “critical mineral” as a **non-fuel** mineral or mineral material **essential** to the economy or national security of the U.S. and which has a **supply chain vulnerable to disruption**. Critical minerals are also characterized as serving an essential function (strategic) in the manufacturing of a product, the absence of which would have significant consequences for the economy or national security.

Aluminum	Antimony	Arsenic	Barite	Beryllium
Bismuth	Boron	Cerium (REE)	Cesium	Chromium
Cobalt	Copper	Dysprosium (REE)	Erbium (REE)	Europium (REE)
Fluorspar	Gadolinium (REE)	Gallium	Germanium	Graphite
Hafnium	Holmium (REE)	Indium	Iridium	Lanthanum (REE)
Lead	Lithium	Lutetium (REE)	Magnesium	Manganese
Metallurgical coal	Neodymium (REE)	Nickel	Niobium	Palladium
Phosphate	Platinum	Potash	Praseodymium (REE)	Rhenium
Rhodium	Rubidium	Ruthenium	Samarium (REE)	Scandium
Silicon	Silver	Tantalum	Tellurium	Terbium (REE)
Thulium (REE)	Tin	Titanium	Tungsten	Uranium
Vanadium	Ytterbium (REE)	Yttrium	Zinc	Zirconium

How much Critical Minerals do we use?

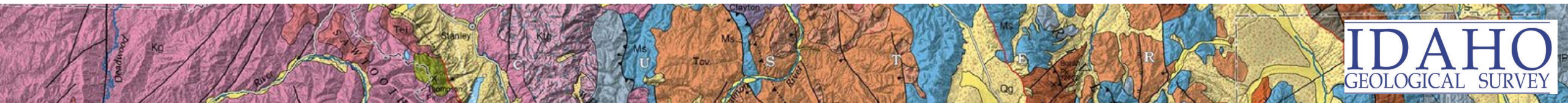
Lots, even in everyday life

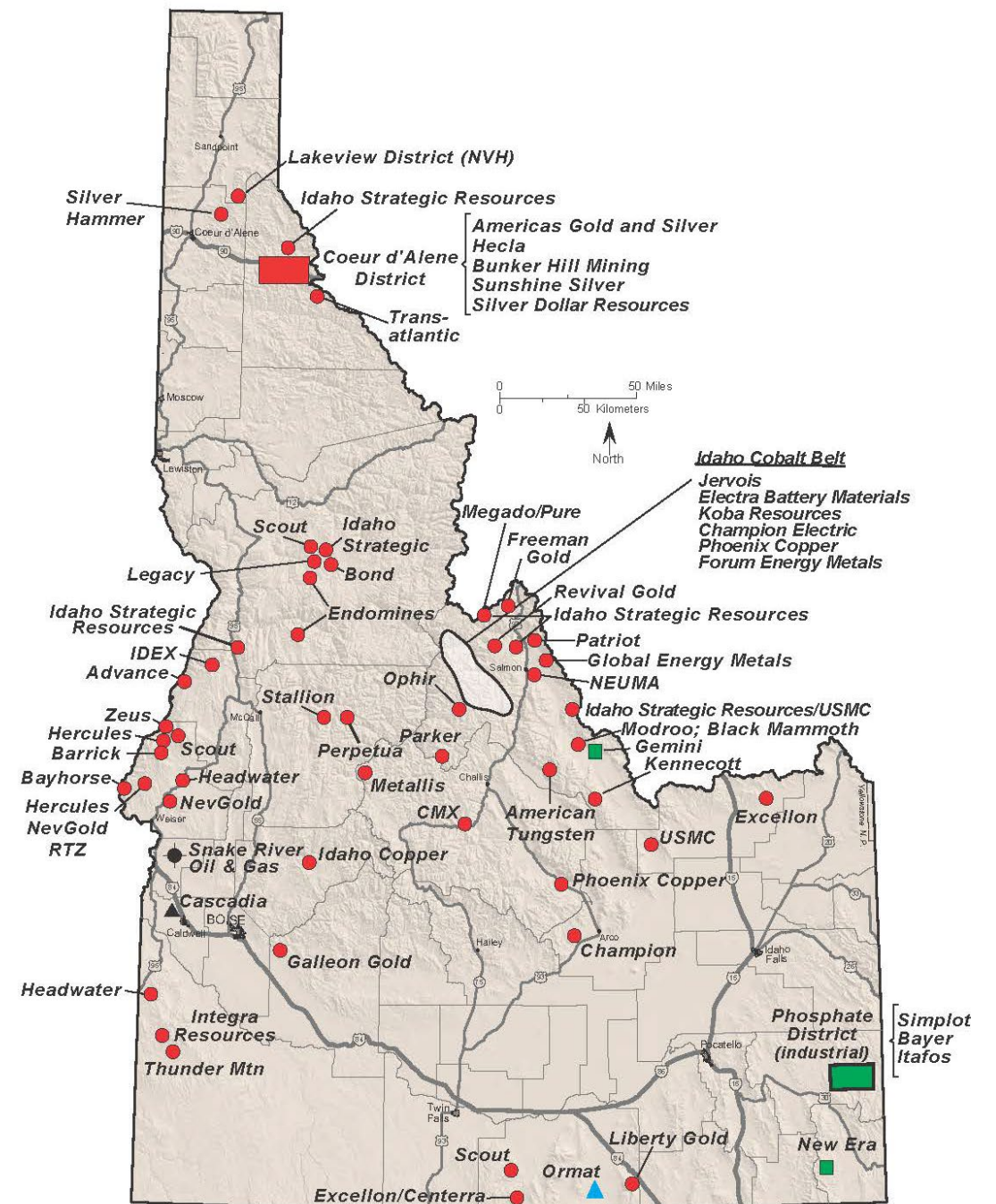
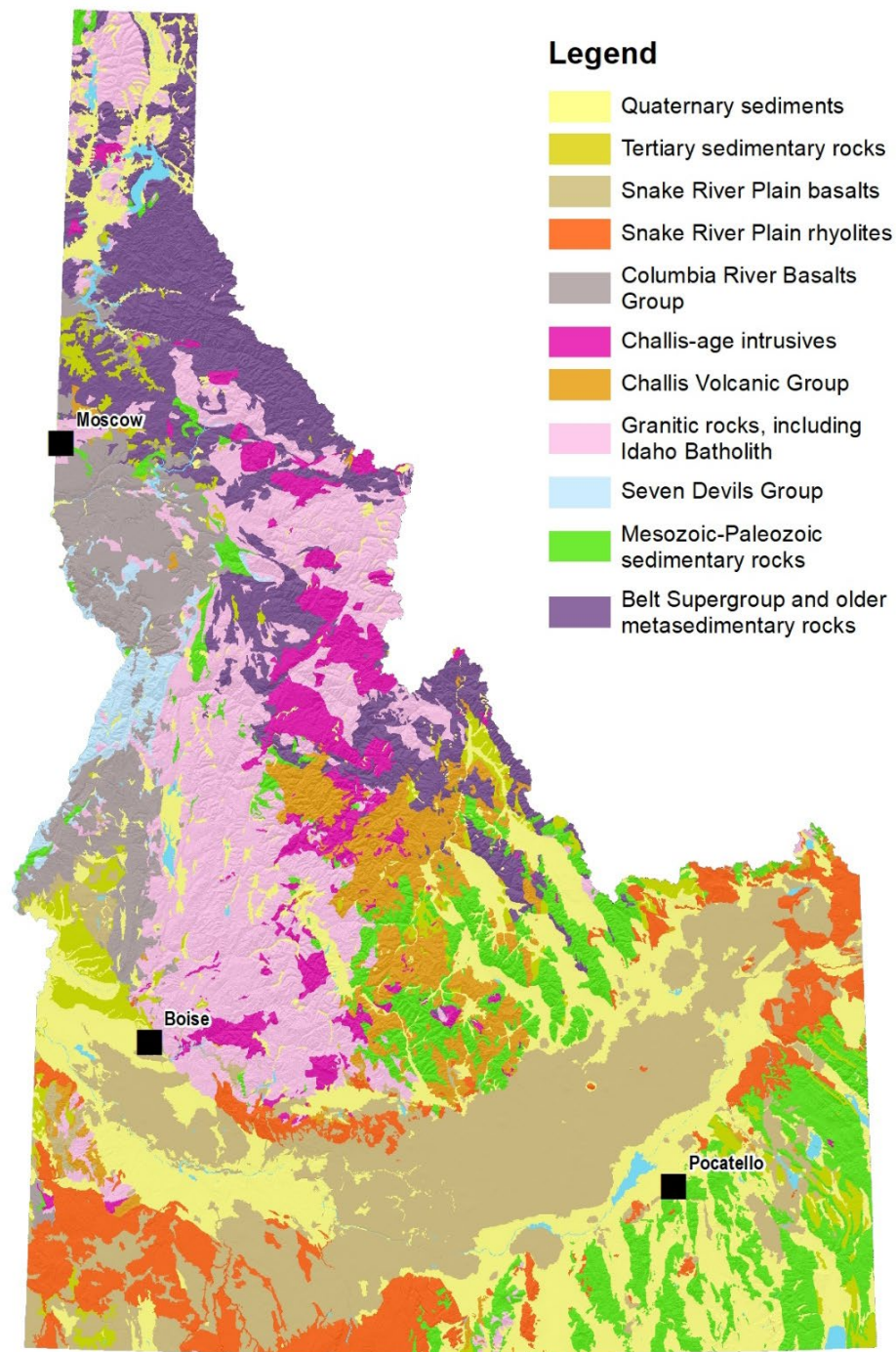


- Unprecedented effort and “directives” in support of American Energy Dominance (executive orders, etc.)
- From the recent (9/23/25) Memorandum by Russel Vought (OMB) and Michael Kratsios (OSTP) on budget priorities:

“[...] To unleash American critical minerals, agencies should invest in R&D for the identification, characterization, and assessment of domestic mineral resources in the United States [...]

Yet...





EXPLORATION 2024-2025

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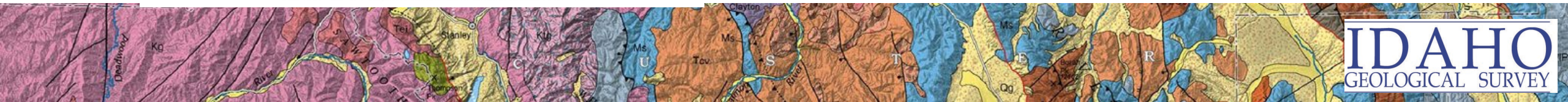
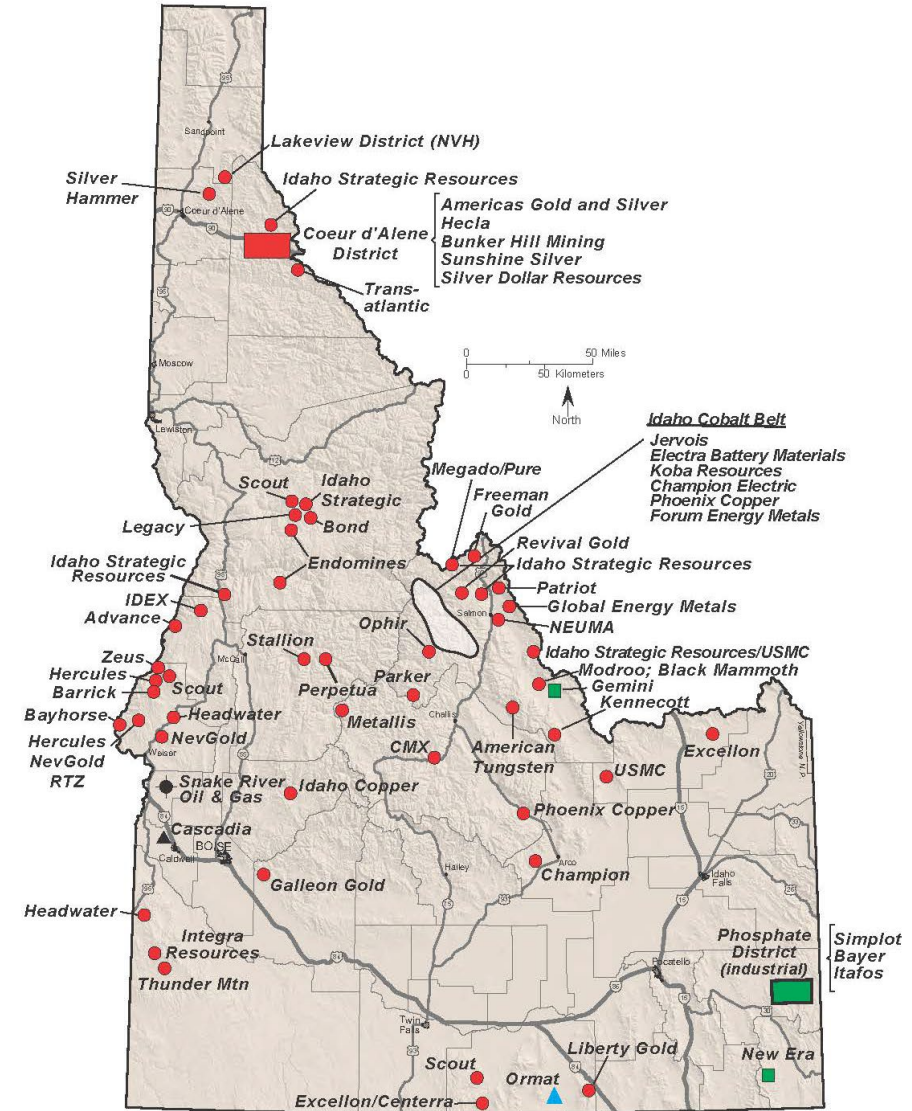
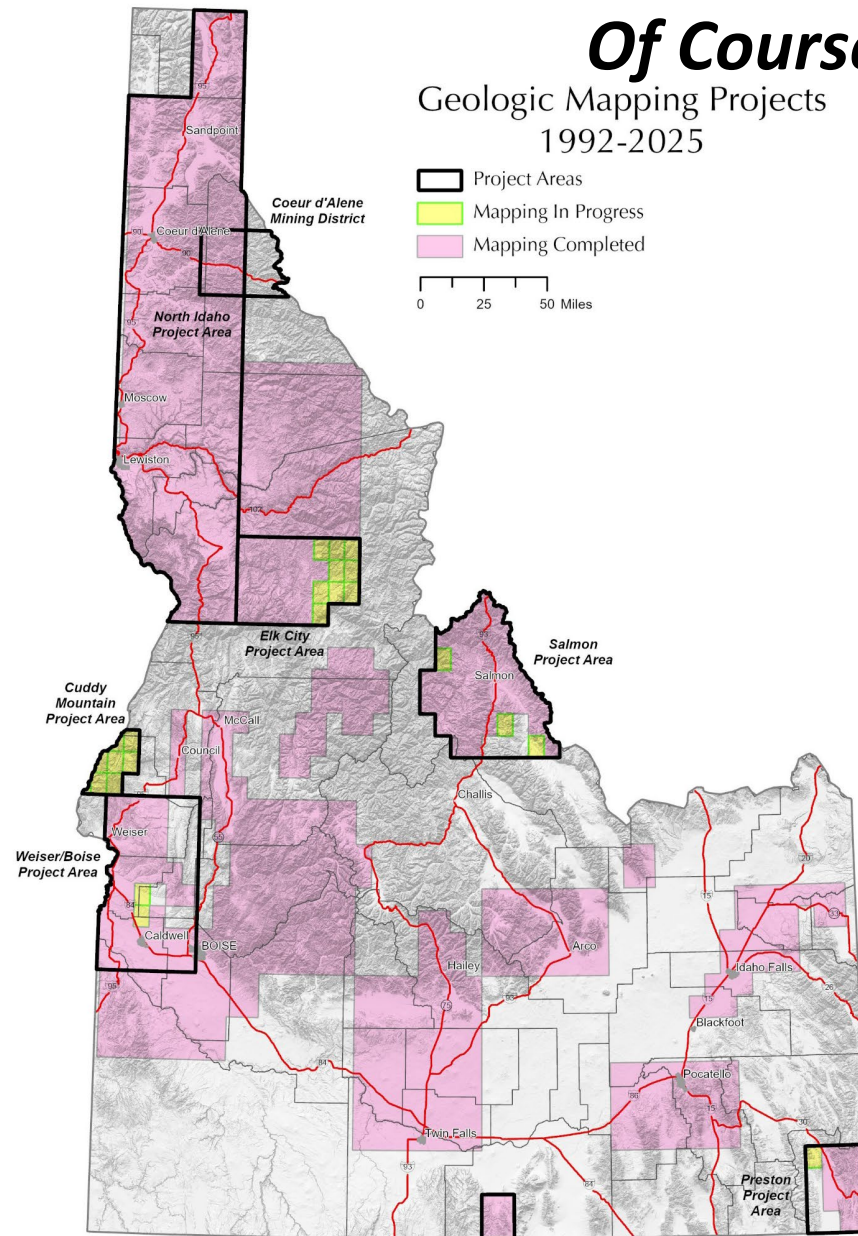
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Of Course, Geologic Mapping!

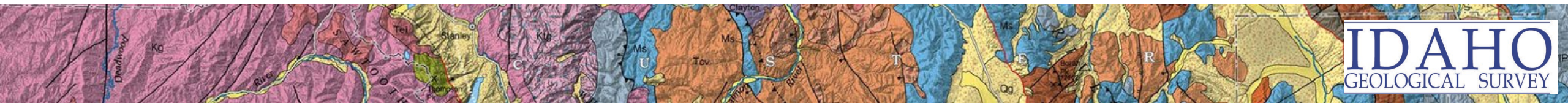
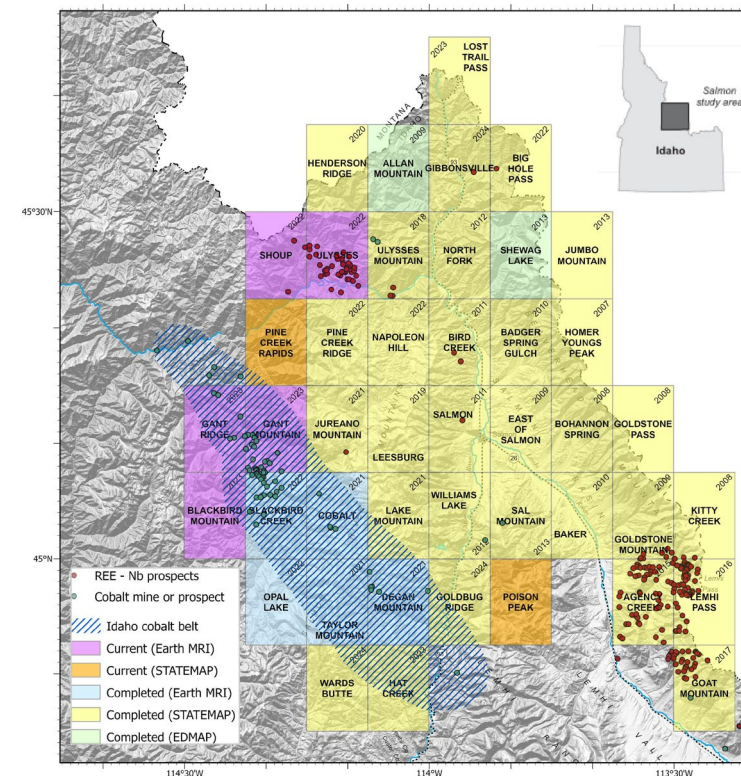
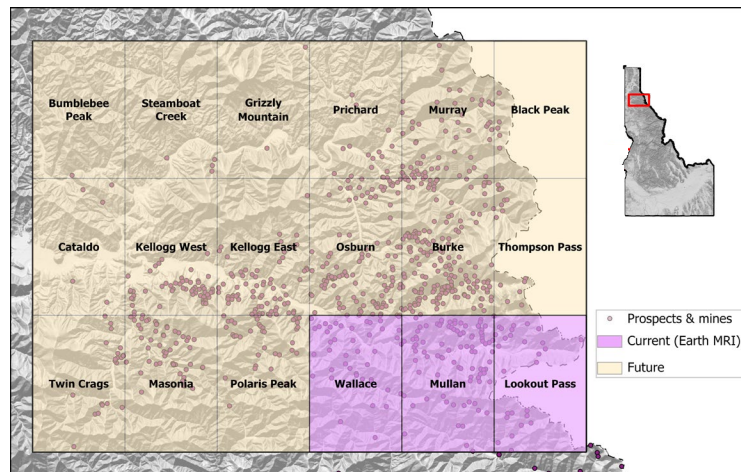
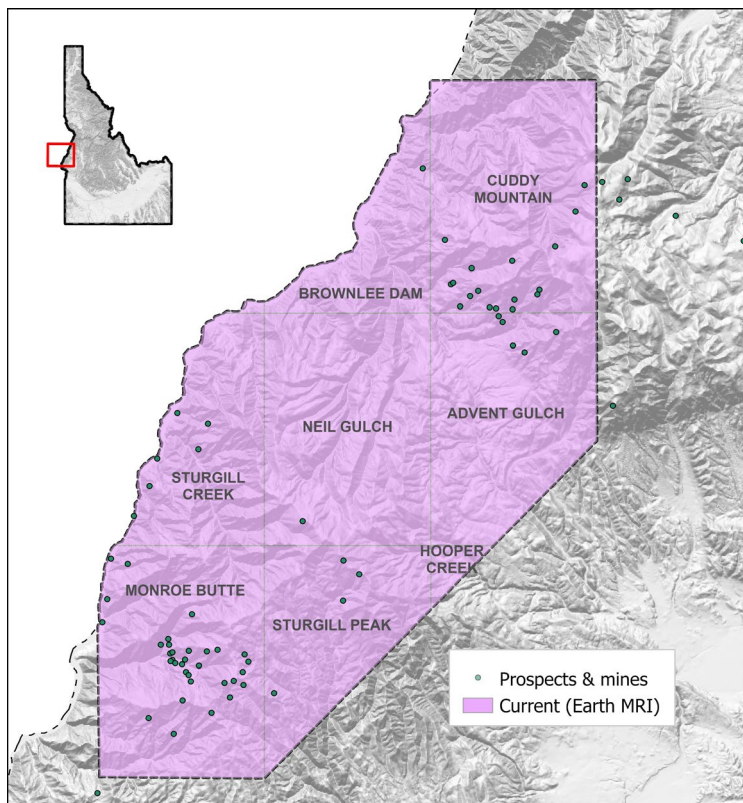
Geologic Mapping Projects
1992-2025

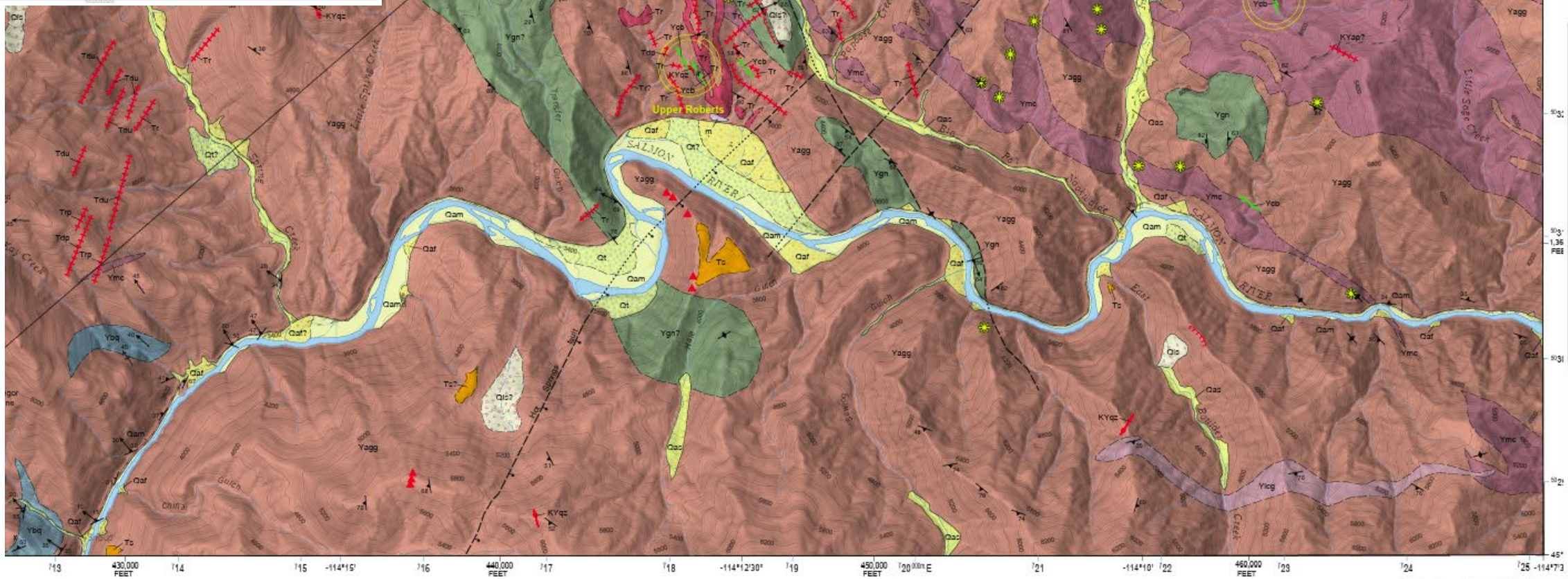
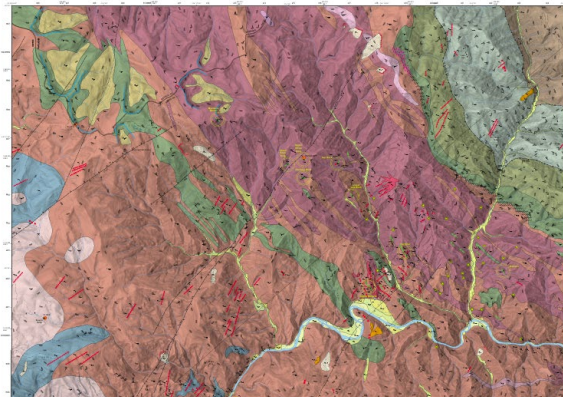


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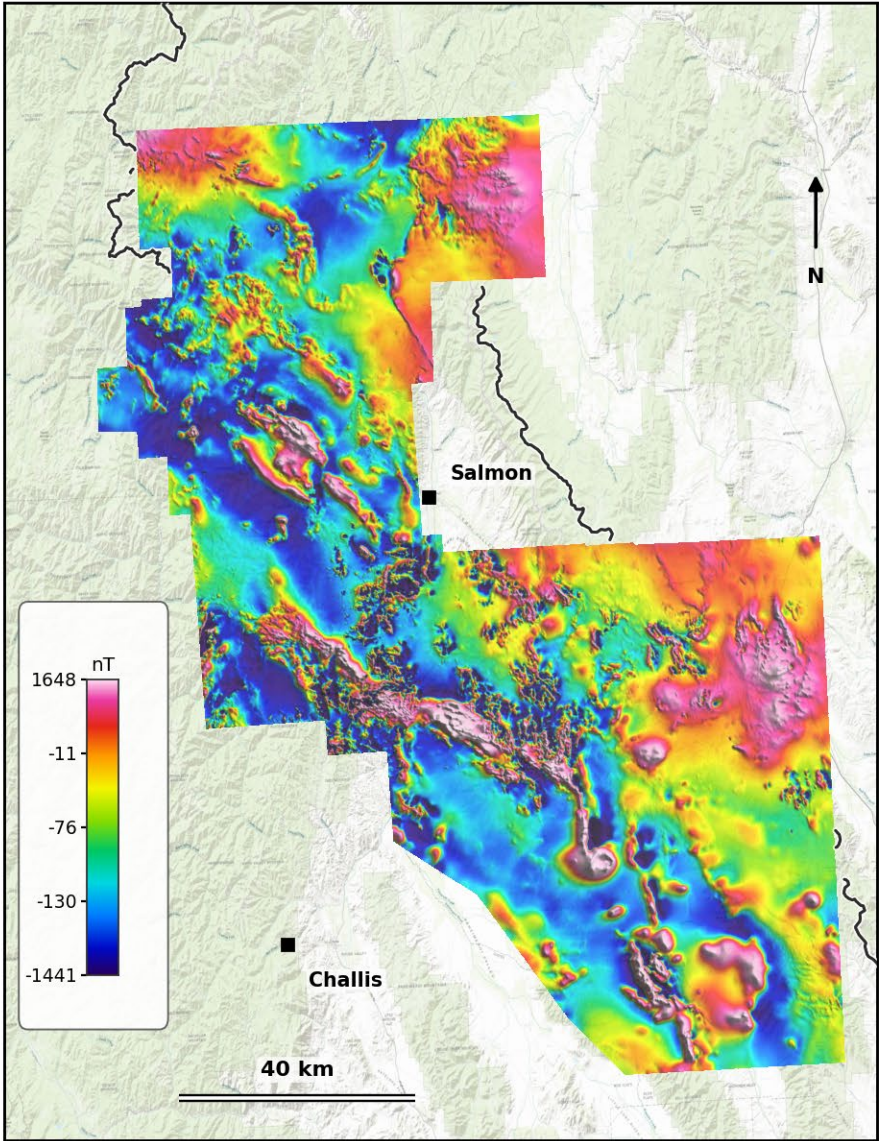
NEW project areas

Funded by Earth MRI and focused on critical minerals

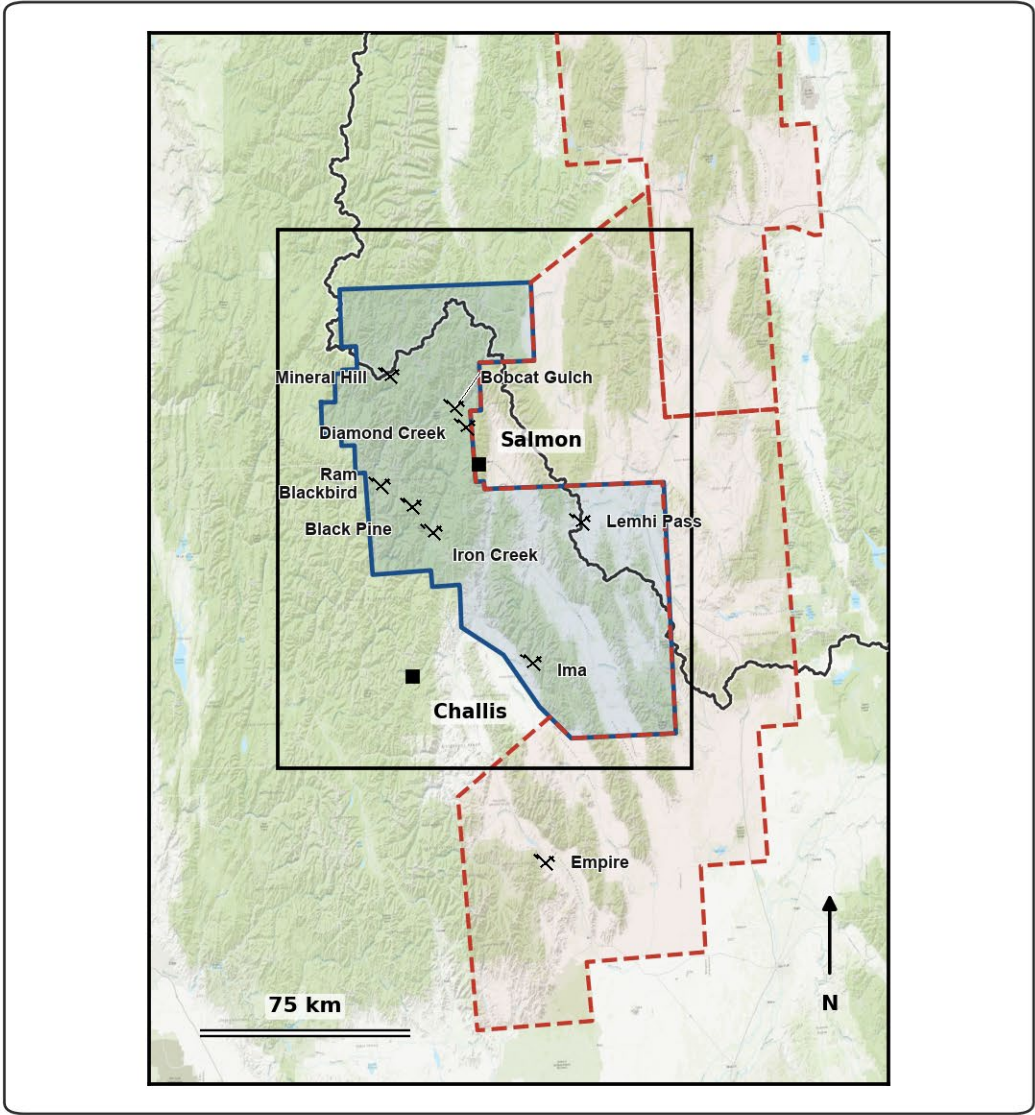




Recent and planned Earth MRI aeromagnetic surveys, east-central Idaho



Merged AMF RTP

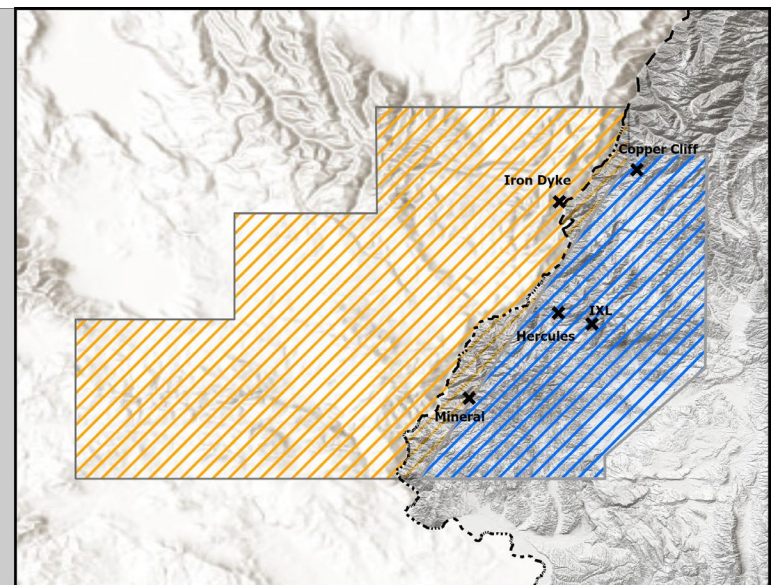
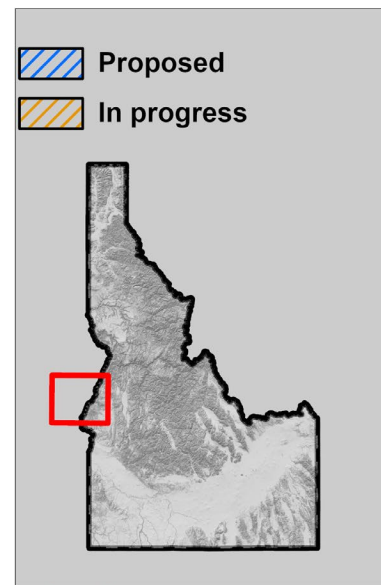
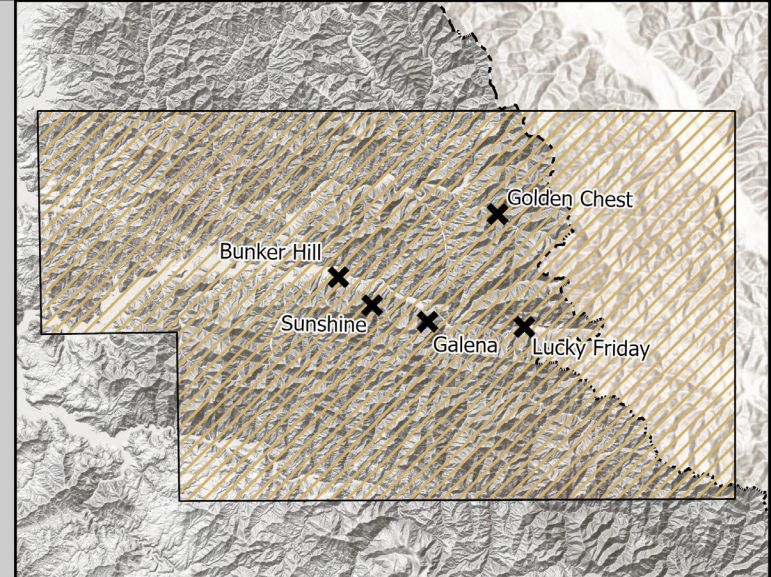
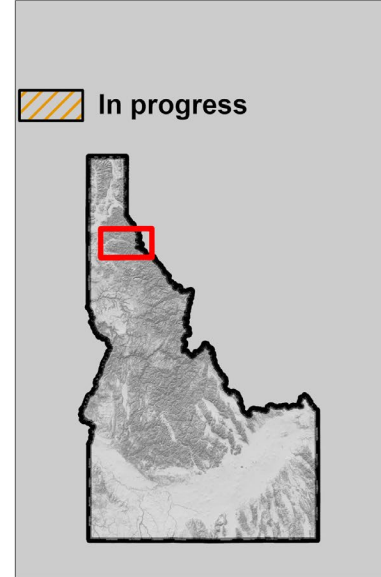
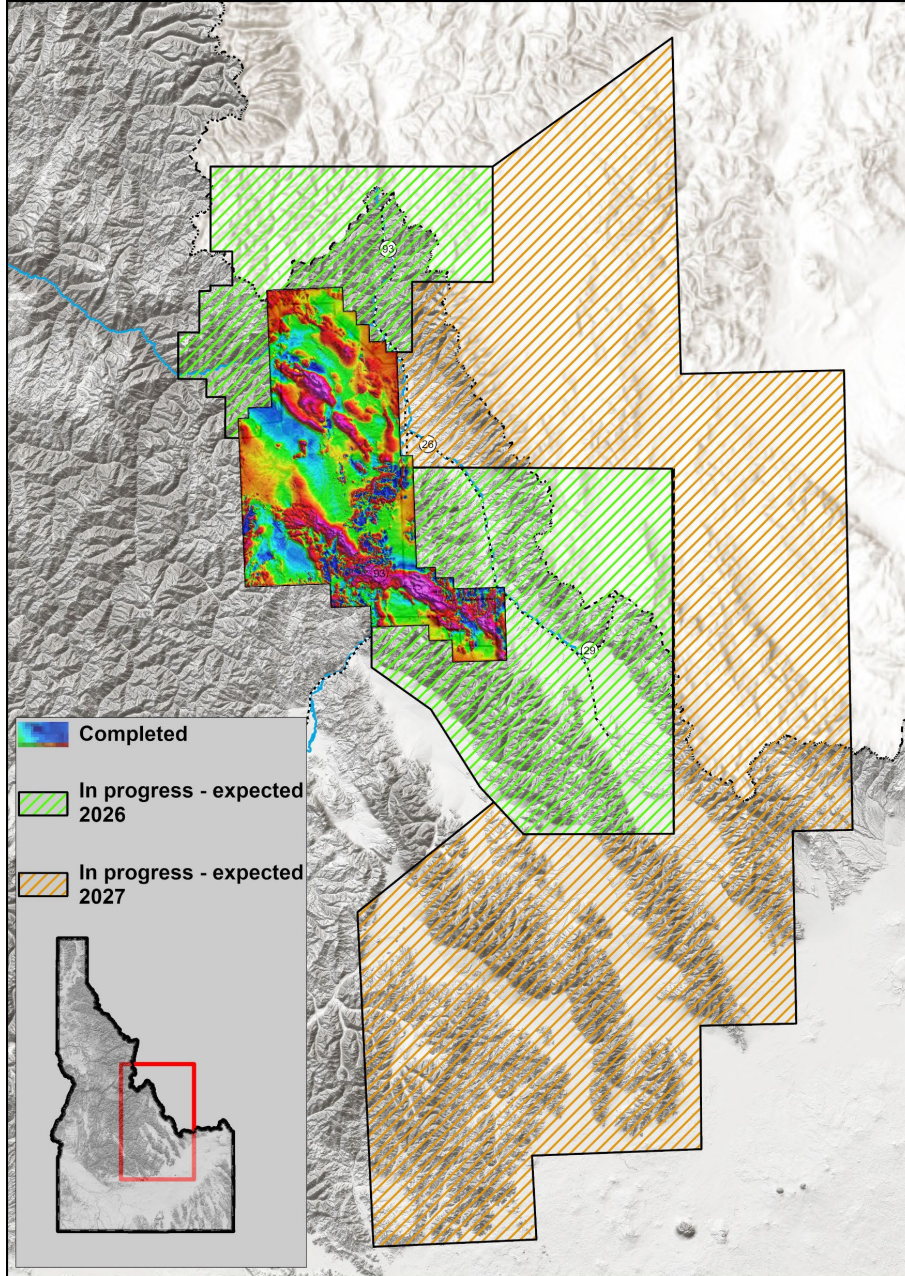


Released and planned Earth MRI coverage

x Critical mineral mines and deposits

- Released / available
- - - Planned / ongoing
- Extent of map at left

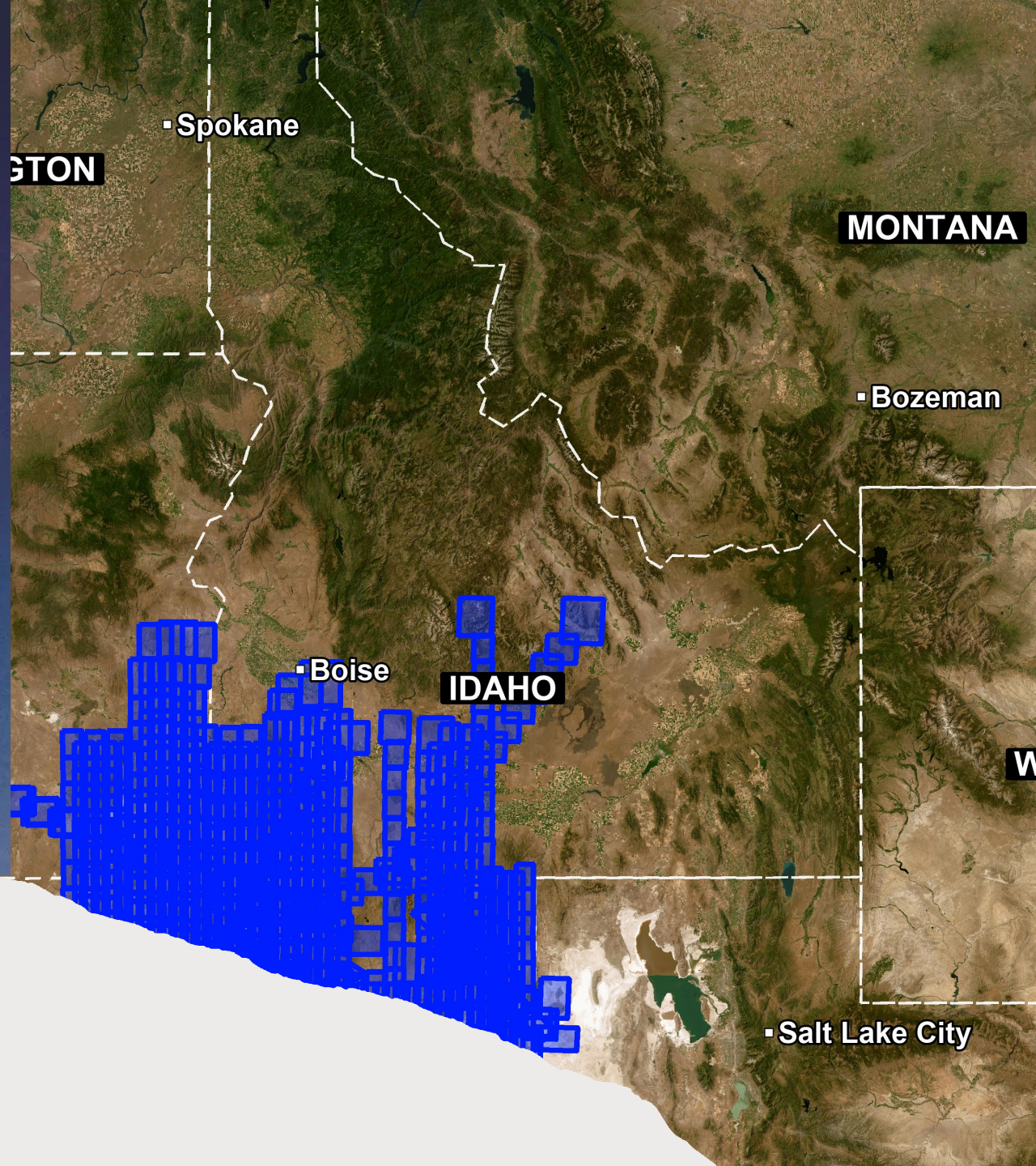
Geophysical data acquisition





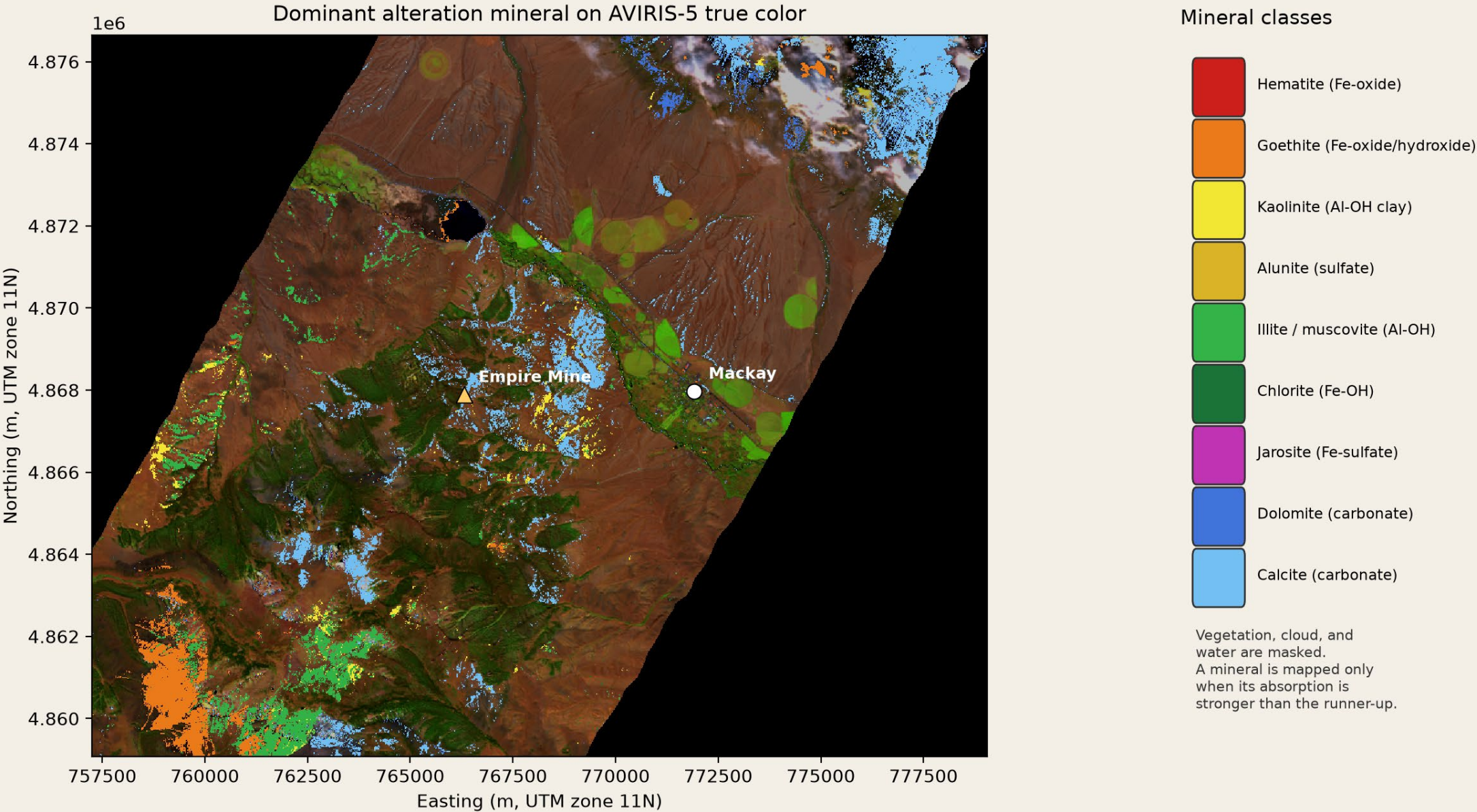
HYPERSPECTRAL

As part of the Earth MRI program, USGS/NASA collected AVIRIS-5 data covering parts of southern Idaho in 2025. This data is used for mineral mapping, assisting exploration for critical mineral deposits.



GEMx AVIRIS-5 alteration minerals around Mackay, Idaho

NASA / USGS Geological Earth Mapping Experiment | flight AV520250922t202228 | 22 September 2025 | AVIRIS-5 L2A surface reflectance (ORNL DAAC 2484)



SALMON REGION MINERAL DEPOSITS LEMHI COUNTY, ID

GOLD: Au in many areas

BTAC

Panther Creek Shear Zone (NE to

N)

North Fork
Gibbonsville
Others

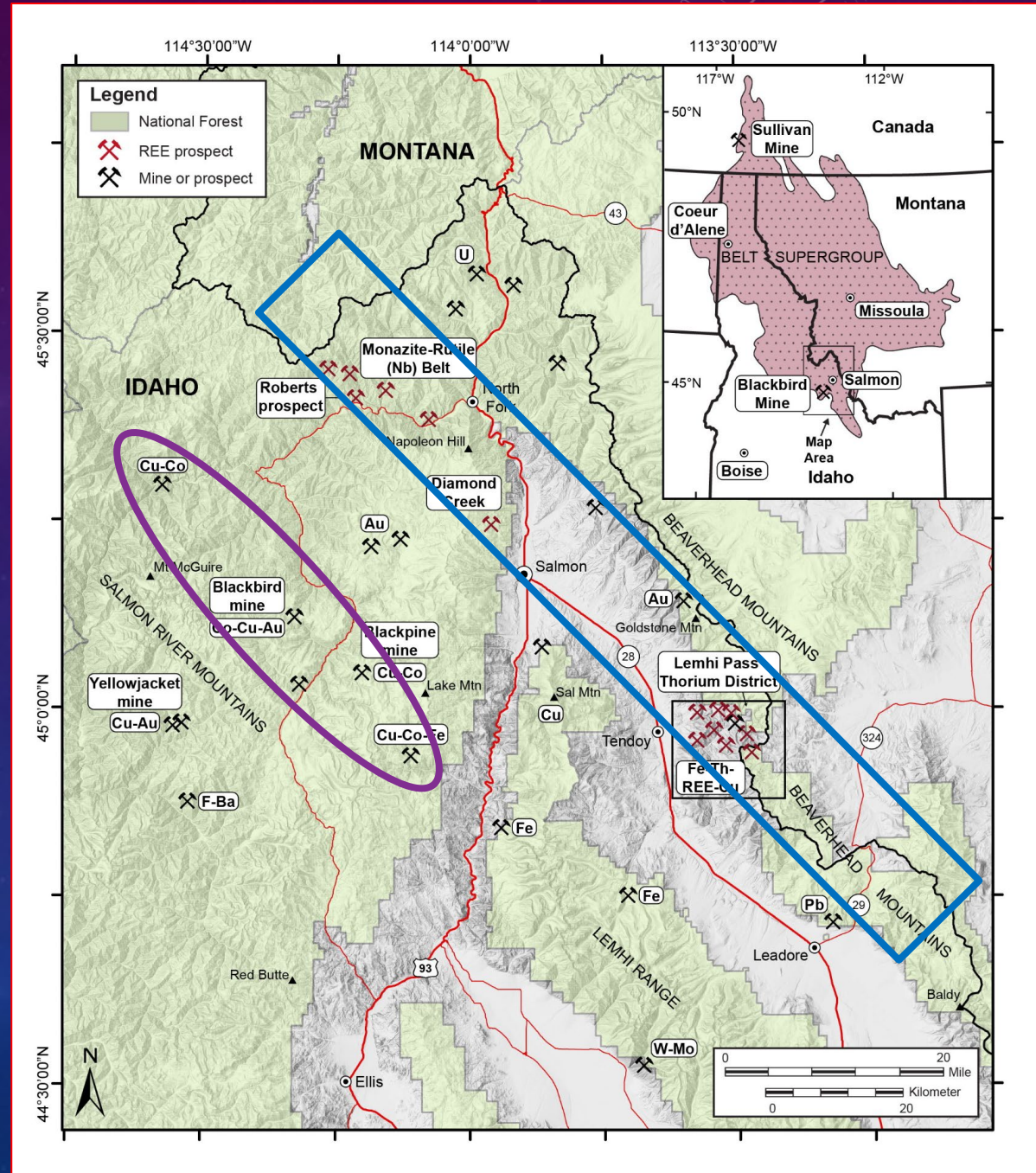
Cobalt Belt (purple outline; NW trend)

Blackbird District and ICO
Blackpine
Iron Creek

REE Belt (blue outline, NW to NNW trend)

Sheep Creek (MT)
Mineral Hill
Diamond Creek
Lemhi Pass (ID and MT)

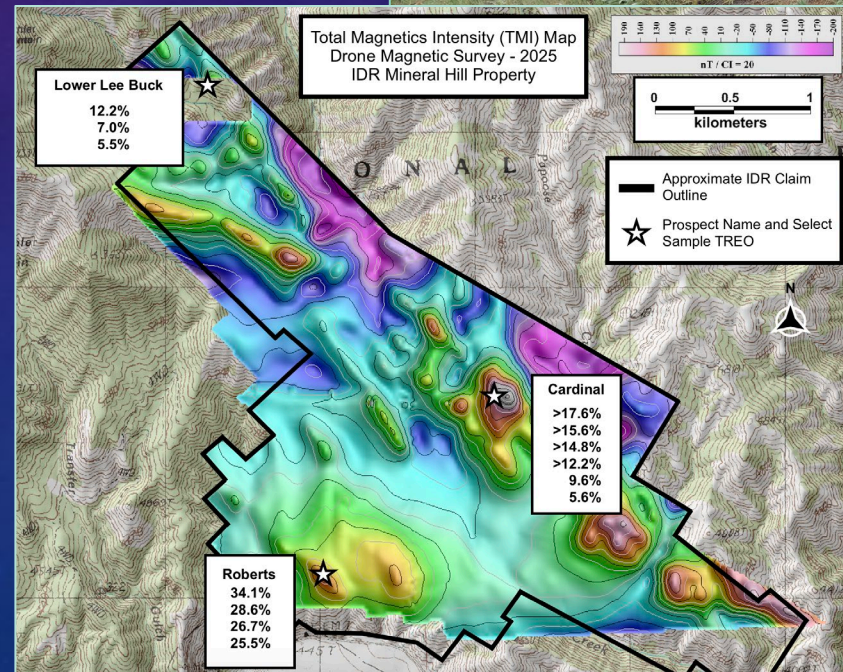
Complex geology
but host rocks are
Mesoproterozoic.



SALMON REGION: RARE EARTHS IDAHO STRATEGIC RESOURCES

- NNW-trending REE Belt along Idaho-Montana border
 - Mineral Hill – Sheep Creek (MT) Monazite-Rutile Belt
 - Lemhi Pass
- IDR – property positions at both
- Drone Magnetism: Mineral Hill Carbonatites
 - TREO (12 – 20 Wt. % TREO)
- Permitting for drilling at Cardinal Prospect, also Diamond Creek

A second company took over Megado claims and was conducting mapping.



*Cardinal Prospect,
Mineral Hill (Shoup area)*

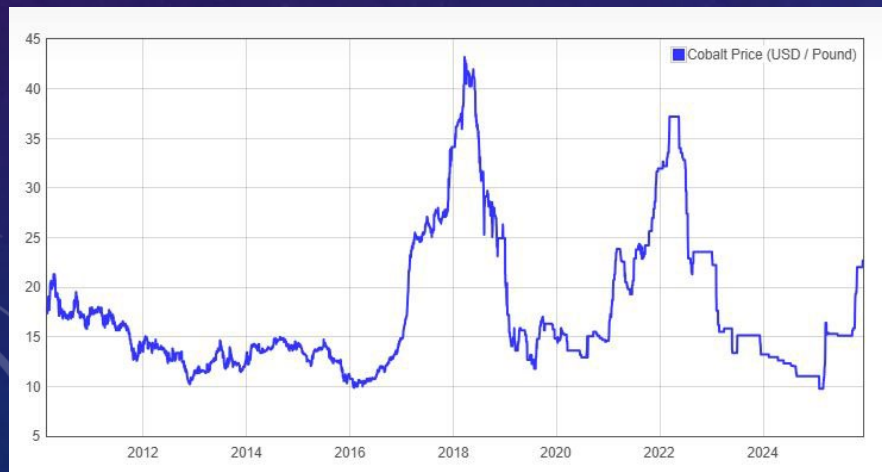
IDAHO COBALT BELT: 2025 UPDATE

VERY QUIET



RAM facilities on ridge after 2024 fires

- **Jervois ICO (Idaho Cobalt Operations)**
- 2024: care and maintenance
- 2025 January: Jervois Global Commenced Ch. 11 Bankruptcy Proceedings (US, Australia)
- May 2025: New Jervois emerged as investor-led group with Brazil refinery asset and others
- ICO under “NewCo”. Facilities in long-term care and maintenance



Dailymetalprice.com

Electra Battery Materials

- Holding Iron Creek Project
- Minimal exploration, processing studies
- Focus and Progress at Ontario refinery project

CENTERRA: THOMPSON CREEK MINE (MO)

- On track for Active Restart (decision Sept. 2024): ~ 145 employees.
- Capital Expenditures to Q3 2025: \$ 113 million
- Stripping in Union Gap and west side of pit; production expected H2 2027.
- Rebuilding heavy equipment fleet, mill, etc.

12/2014: Placed
on care and
maintenance
Mo ~ \$ 11/lb

2024: Mo > \$ 25/lb
Dec. 2025: Mo > \$ 29/lb

Langeloth, PA Moly
Roaster Facility



Approx. 47,000 t/day stripping overburden to reach Phase 8 reserve

PERPETUA RESOURCES: STIBNITE GOLD PROJECT (+SB)



Historic and well-photographed Yellow Pine pit

January 2025: USFS issued favorable Final Record of Decision
Completed basic engineering/costs; power contracts
Financing (inc. Agnico Eagle, JP Morgan Chase;
Selected as priority project by White House
USFS Notice to Proceed
October: Posted financial assurance bond

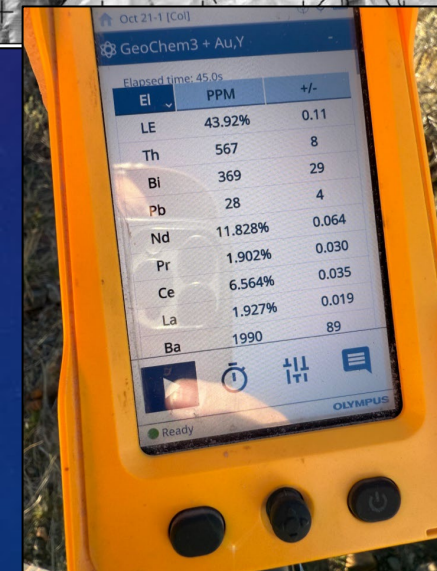
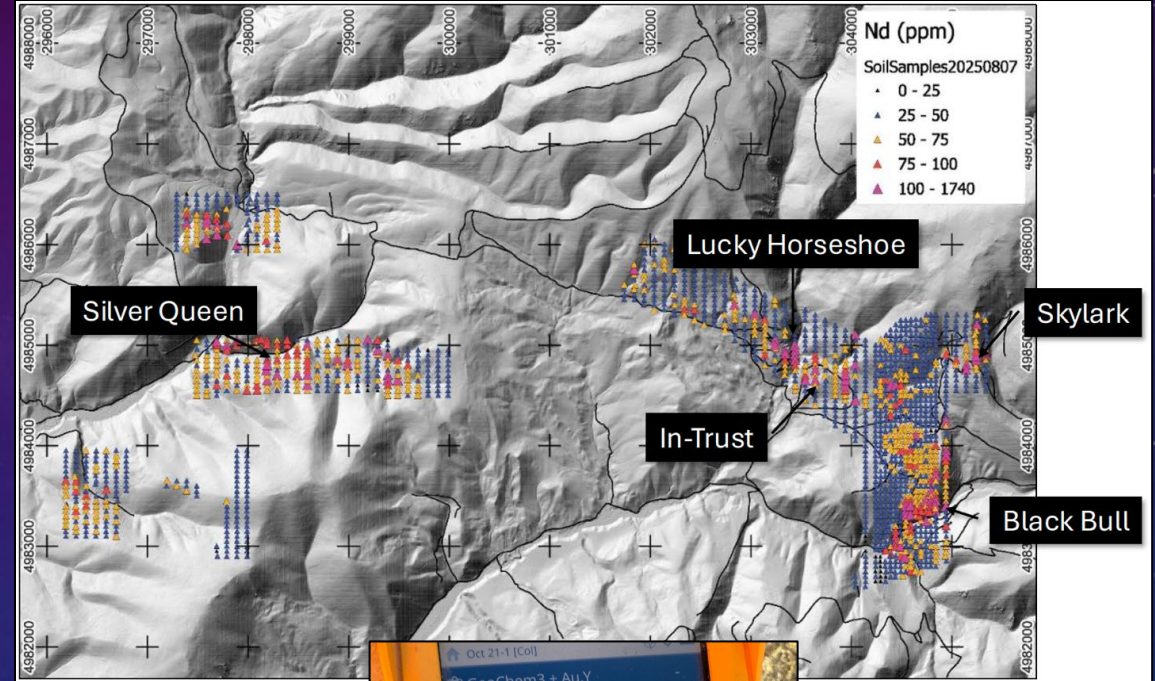


*September 2025 Ribbon-cutting: 200 attendees
Idaho Governor Little; US Army General Reim;
Perpetua CEO Jon Cherry*

IDAHO STRATEGIC RESOURCES: LEMHI PASS PROJECT

RARE EARTHS AND THORIUM

- Th-REE-Fe veins and replacements
- Discovered ~ 1949 post-war U boom; USGS, IBMG, industry work in 1960s, 1970s for Th. Later interest in REEs. IGS work authored article in *Minerals* (2025).
- Unique chemistry: Neodymium (Nd)-enriched
 - High in Nd, Pr, MREE (battery metals)
- Mineralogy: Specular hematite – thorite - monazite
- Land acquisition (~ 11,000 acre package)
- **2025:**
 - **Ground-based radiometrics**
 - **2000 soil samples**
 - Discovered first carbonatite
 - **Drilling started late fall 2025 – focus on Lucky Horseshoe and nearby prospects**
 - Processing studies and cooperatives with Idaho National Laboratory, Clean Core Thorium



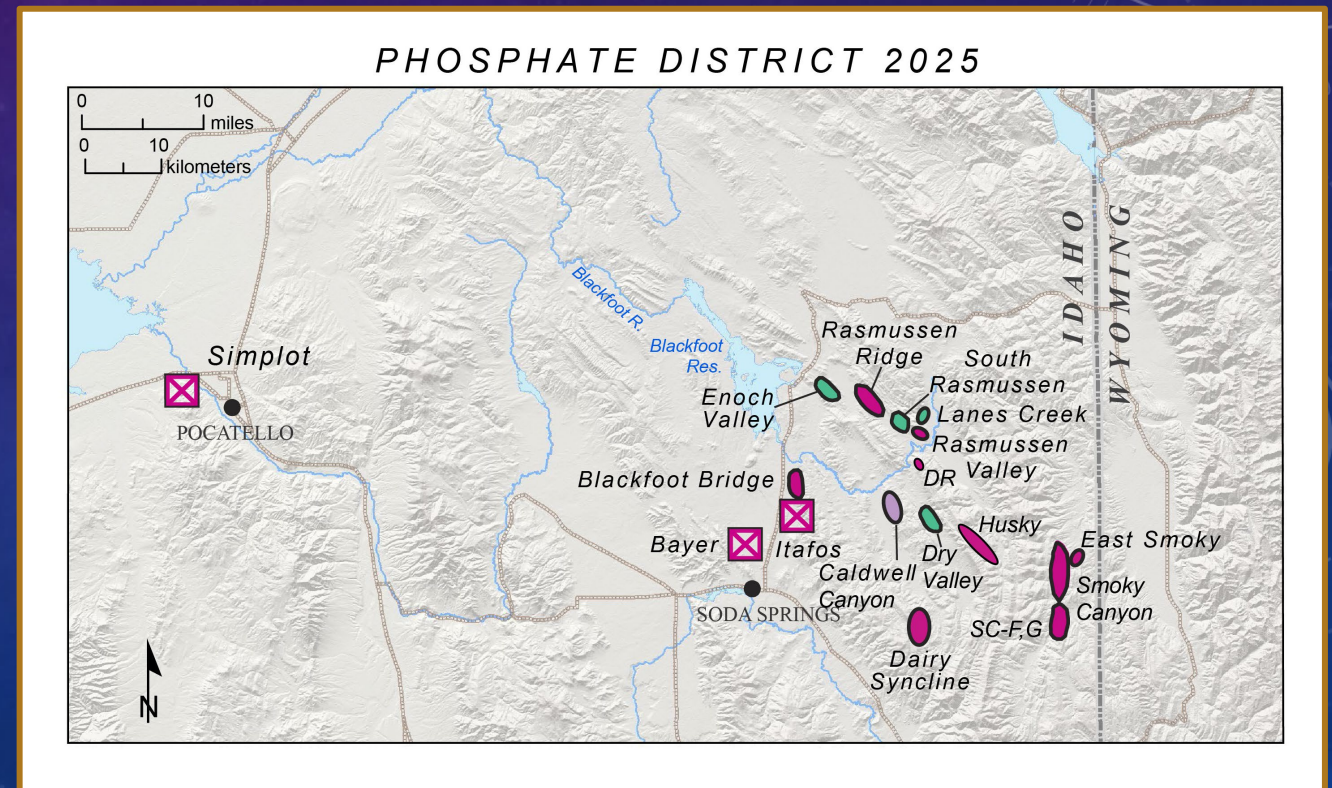


AMERICAN TUNGSTEN: IMA MINE

- Ima Mine, Lemhi Range
- Patterson, ID
- W discovered 1903. Bradley Mining started production of W in 1945; DMEA contract; Inspiration and others ~ 1980. UG work.
- 198,333 units WO_3 produced (1934-1982).
- Gentor Resources: Mo exploration and drilling (2008).
- 2024: Optioned by American Tungsten. Patented claims plus federal mining claims for 2000 acres.
- 2025: New 43-101 work; financing; geologic model; rehabilitation of old workings for drilling.
- Quartz veins with hubnerite $(\text{Mn,Fe})\text{WO}_4$ + sulfides.
- Drilling commenced early December. Phase 1 ~ 12,000 feet of underground diamond drilling, D Level, Zero Level. Test W veins and Mo intercepts.

IDAHO PHOSPHATE INDUSTRY – 2025

- Provides 30% of US and 8 % global phosphate (BLM)
- Mainstay of SE Idaho Economy
- Contributed ~ 1700 direct jobs, \$ 206 million payroll,
 - \$ 681 million to Idaho gross state product
 - (IDEQ, 2024)
- 89 active leases, 45,000 acres in Idaho
- Five active mines (3 mining; 2 in transition)
 - Several prior mines in reclamation/clean-up
- Three large processing plants
 - Phosphoric Acid Fertilizer (Simplot, Itafos)
 - Elemental P (Bayer)
- 2025: Full production
 - Approximately 4-5M metric tons per year; exact production number is concealed by USGS



J.R. SIMPLOT COMPANY: SMOKY CANYON MINE

- Mining in Panel F (Manning Creek lease)
- Mining in Panel B
- Covered ~ 18 acres of East waste dump with Enhanced Dinwoody Shale Cover
- All mines using cover systems or other BMPs for seleniferous waste rock
- Investigating in-pit crushing



F panel, looking S (2024)

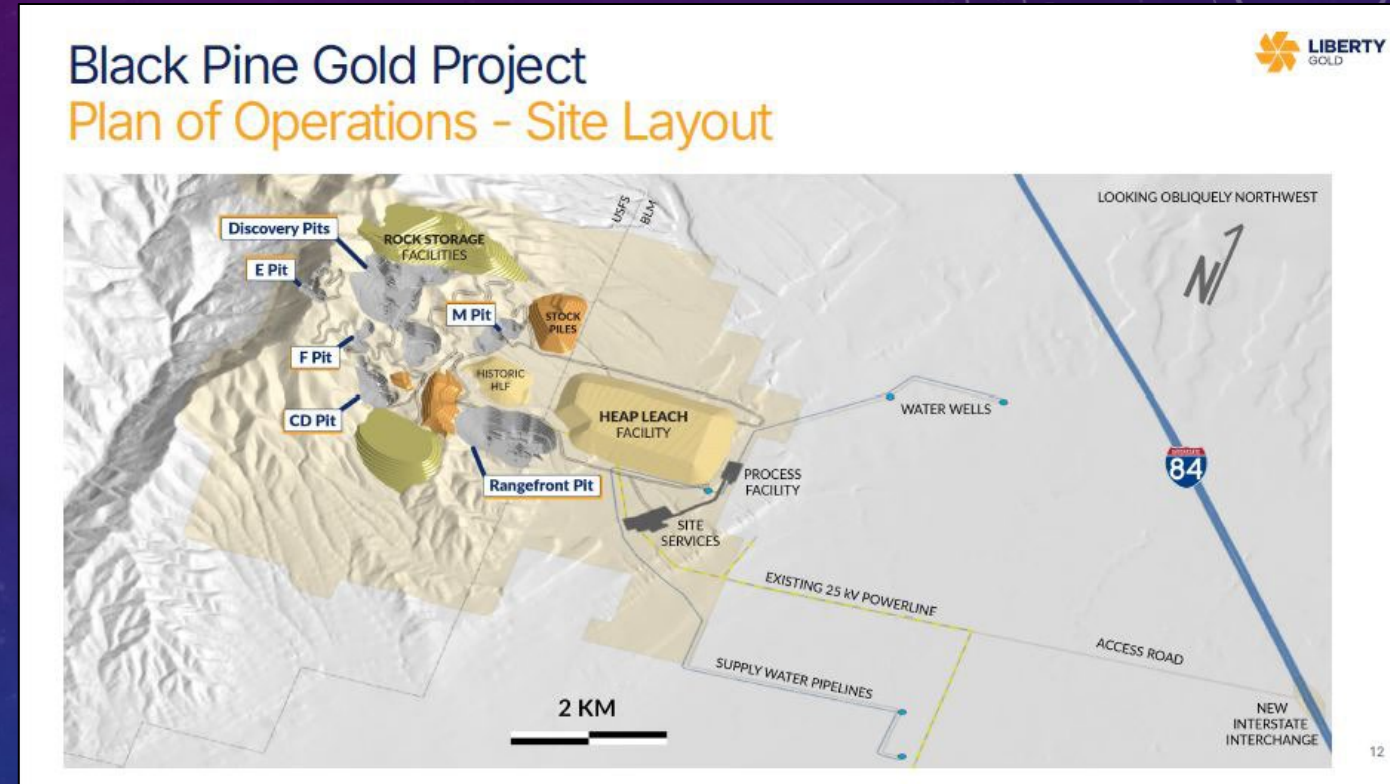


Crushing tests at Smoky Canyon

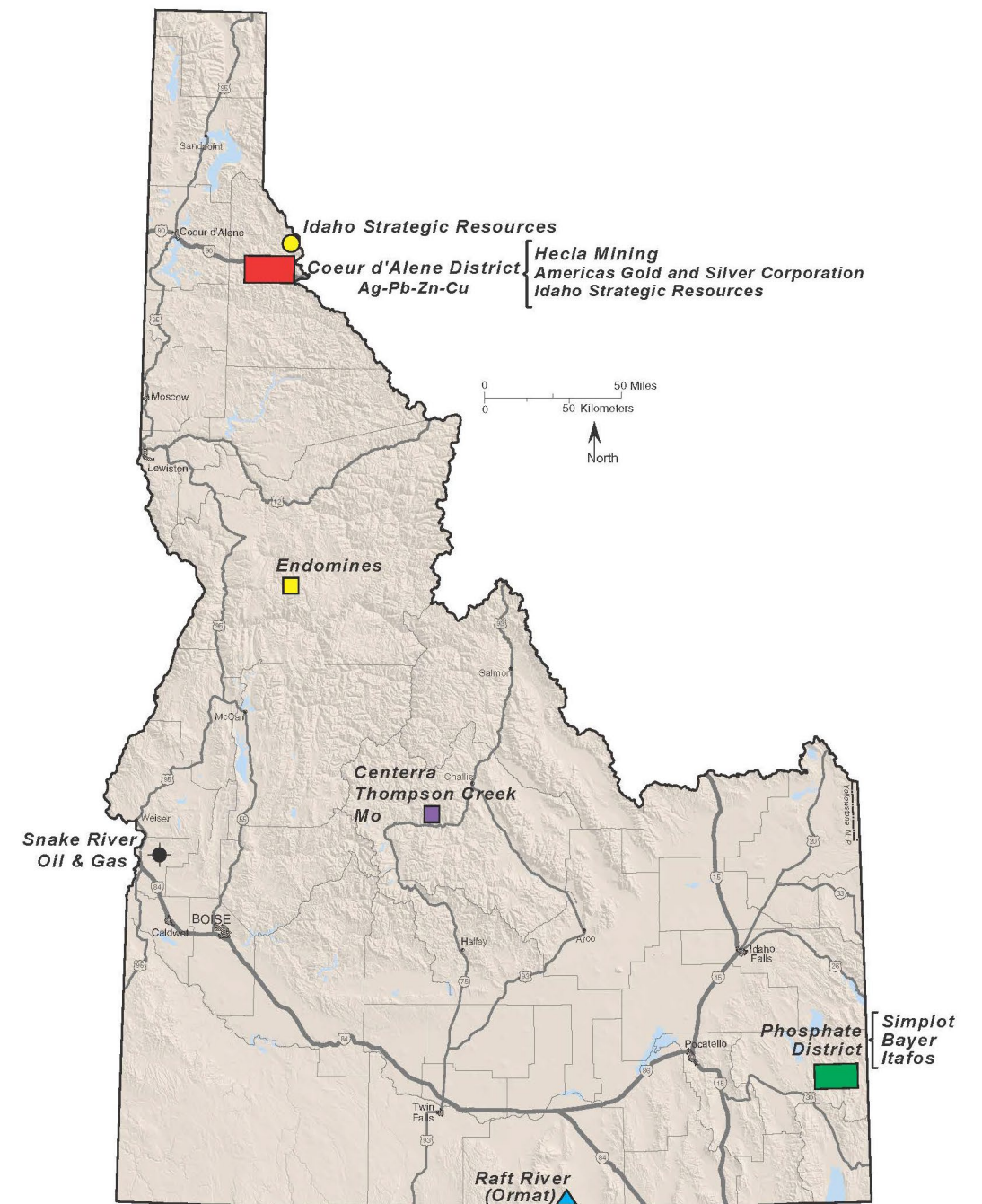
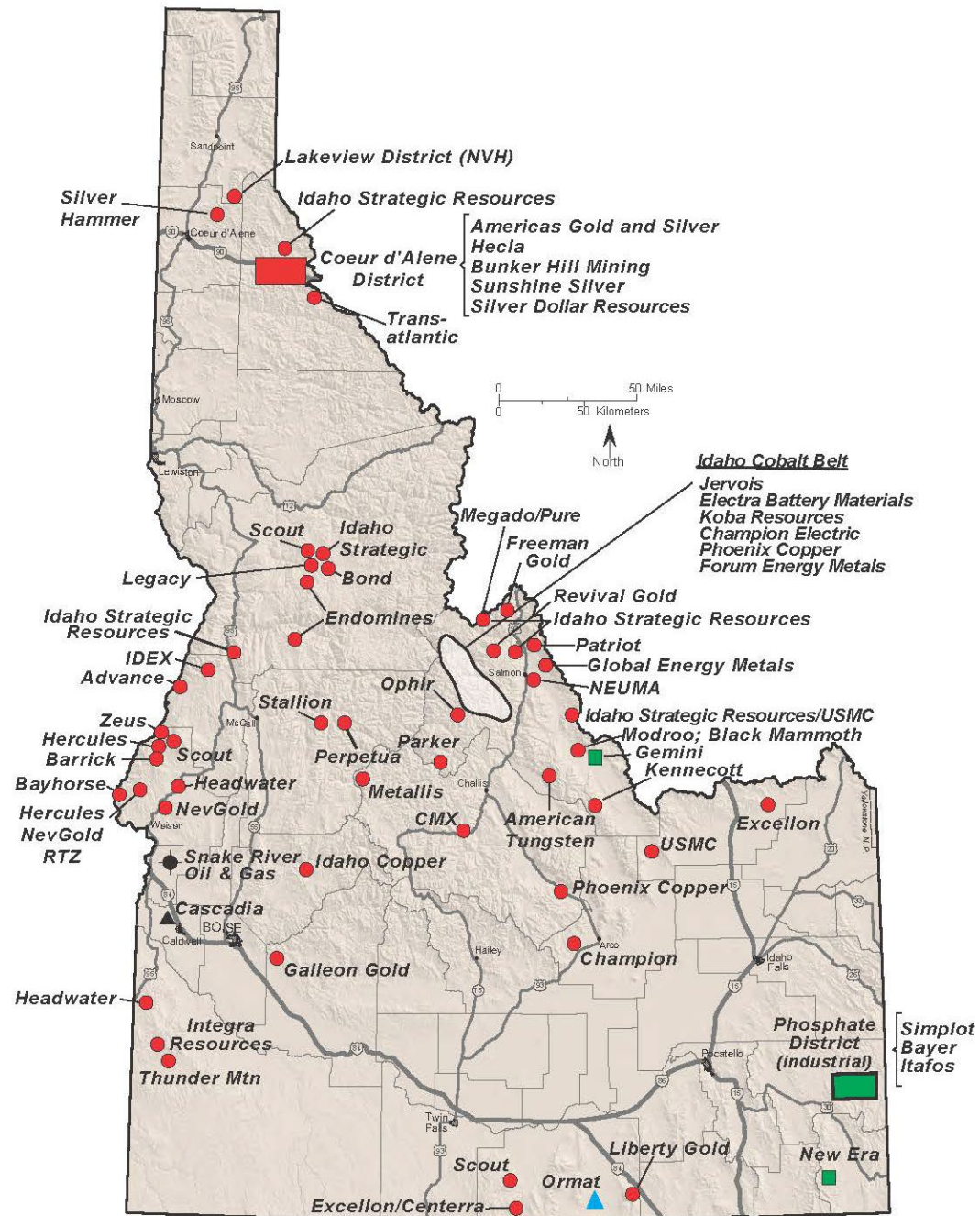
LIBERTY GOLD: BLACK PINE GOLD PROJECT

CASSIA COUNTY

- Idaho's "Carlin-style" gold district
- Former Pegasus mine (1990s) with ~ 600K oz. Au
- Liberty acquired project
- 4.1M oz Au, past-producing, open-pit, large-scale, heap leach oxide gold project
- 2024 Preliminary Feasibility Study
 - 183,000 oz/yr for years 1 to 5 (0.45 g/t Au head grade)
 - 2.2 Moz gold production over 17 years
 - 3.3-year payback on initial capital
- Clear development pathway for technically simple & environmentally responsible gold project



Gold + freeway within 5 miles, power lines, water wells: How easy can it be?



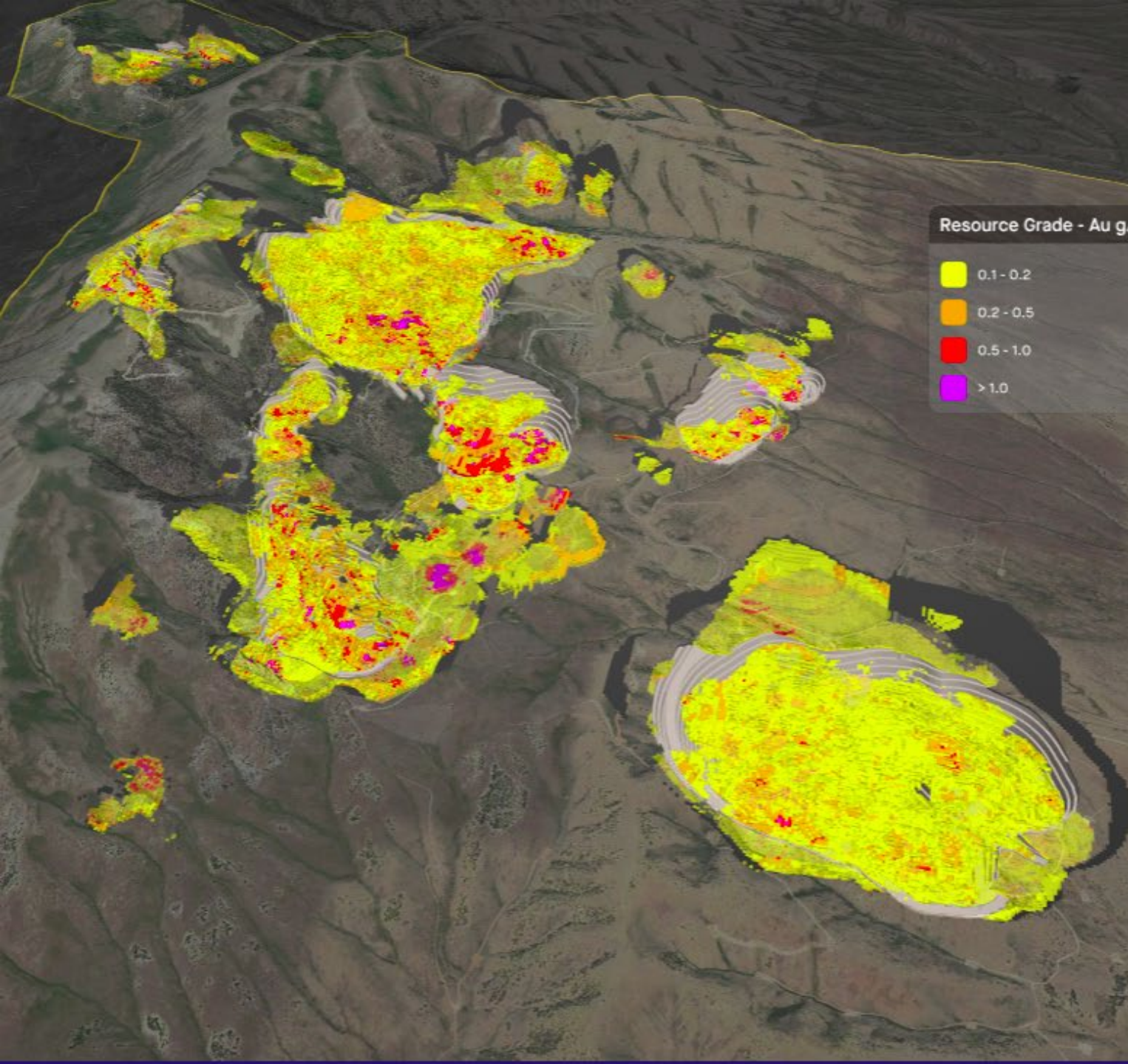
Mining Cycle – simplified: Mine Startup in US: 5 to 25 years

Exploration to Discovery

- ▶ Target Concept
- ▶ Exploration – recon
- ▶ Property Acquisition
- ▶ Drilling - Exploration
- ▶ Discovery to Delineation Drilling
- ▶ Fund-raising
- ▶ Metallurgical Tests, Economic Analysis
- ▶ Public Relations/Community ESG
- ▶ Permitting: Federal NEPA, State
 - ▶ Appeals of ROD by NGOs

Mining to Closure

- ▶ Mine Financing
- ▶ Engineering Studies, Economic Studies, Mine Plan Optimization and Environmental Modelling
 - ▶ Global Market Conditions for 20+ year projections
- ▶ Mining and Processing:
 - ▶ Mill- Ore Grinding/separation to Concentrate
 - ▶ Concentrate to Smelter or Refinery
 - ▶ Refinery to Intermediate Product
 - ▶ To End User
- ▶ Mine Reclamation and Closure
 - ▶ Required by State and Federal Regulations/Banks



Required State and Federal Permits	Agency
Final MPO (Approx. EIS Schedule Above)	BLM
Historic Properties Treatment Plan	BLM/ SHPO
Surface Rights Lease Agreement	IDL
IPDES Construction General Permit	IDEQ
Section 404 General Permit	USACE
IDWR Stream Channel Alteration Permit	IDL
401 Water Quality Certification	IDEQ
Jurisdictional Waters/Wetlands Mitigation Implementation	USACE
Cyanidation Permit	IDEQ
Point of Compliance	IDEQ
NPDES/IPDES Industrial Stormwater Permit	IDEQ
NPDES/IPDES Industrial Non-POTW Permit	IDEQ
Dam Safety Permit	IDWR
Air Permit to Construct	IDEQ
Air Operations Permit	IDEQ
Reclamation Permit	IDL

How to maximize opportunities?

- ▶ Investments by the State – everyone around us is doing it!
- ▶ Provide incentives to junior companies – precompetitive data, not tax cuts
- ▶ Enhance attractiveness by investing in data acquisition!
- ▶ Collect and preserve exploration data and samples
- ▶ Baseline data (for both exploration and conservation)- need to prepare for what's coming
- ▶ Help agencies with relations w/ federal government! – permitting
- ▶ Idaho invests between 1/20 and 1/100 of other states in the west – not sure how this can lead to be leaders.