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RÉSUMÉ

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New Mexico Bureau of Geology and Mineral Resources New Mexico
Institute of Mining and Technology
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B.S. in Geology and B.S. in Geophysics (1977, NMIMT), M.S. in Geology (1980, NMIMT),
Ph.D. in Geoscience (1993, UTEP).

Certified Professional Geologist #CPG-7438 (AIPG)

Principal Senior Economic Geologist, Minerals Outreach Liaison, New Mexico Bureau of
Geology and Mineral Resources, New Mexico Institute of Mining and Technology
Adjunct Professor, Earth and Environmental Science Department and Mineral Engineering
Department, New Mexico Institute of Mining and Technology

EDUCATION

- Graduated Woodlawn Senior High School, Baltimore, MD 1973
- Graduated New Mexico Institute of Mining and Technology, Socorro, NM, B.S. 1977, M.S. 1980
- Graduated New Mexico Institute of Mining and Technology, Socorro, NM, M.S. 1980
- Graduated University of Texas at El Paso, Ph.D. 1993
- Numerous short courses on geochemistry, environmental geology, exploration, porphyry copper deposits, design and management of databases, GIS ARCMAP, geotechnical engineering of mine slopes and waste rock piles, uranium geology and geochemistry, mine reclamation, structural geology in exploration, geometallurgy

CLASSES TEACH (<http://geoinfo.nmt.edu/staff/mclemore/imclass/home.html>)

- Geology of the Industrial Minerals (graduate level)
- Geology of uranium deposits (graduate level)
- Geology of critical and strategic minerals (graduate level)
- Mineral deposits of New Mexico (graduate level)
- REE in coal deposits (graduate level)
- Databases and critical minerals (graduate level)
- Exploration Geochemistry (graduate level)
- Teach gold panning, critical minerals, and mining to Rockin' Around New Mexico (<https://geoinfo.nmt.edu/education/rockin/home.html>)

MEMBERSHIP IN PROFESSIONAL SOCIETIES

- American Institute of Professional Geologists (AIPG)—CPG #7438
- New Mexico Geological Society (NMGS) (Honorary Member)
- Geological Society of America (GSA) (Fellow)
- Association of Applied Geochemistry (AAG) (Fellow)
- Society of Mining, Metallurgy, and Exploration (AIME-SME, committee member)
- Society of Economic Geologists (SEG)(Fellow)
- New Mexico Mining Association (NMMA)
- American Society for Surface Mining and Reclamation (ASSMR, Life Member)
- Acid Drainage Technology Initiative—Metal Mines Sector (committee member)
- Society of Geology Applied to Mineral Deposits (SGA)
- American Exploration and Mining Association (AEMA)
- National Mining History Association (committee member)

LIST OF CURRENT PROJECTS AT NMBGMR

- Mineral resources in New Mexico (uses, geology, origin, resource potential, environmental assessment) [Bureau Staff: Virginia McLemore \(nmt.edu\)](#)
 - Metals production from New Mexico
<https://geoinfo.nmt.edu/staff/mclemore/MineralProductionfromNewMexico.html>
 - Economic impact of mineral resources in New Mexico
https://geoinfo.nmt.edu/publications/guides/decisionmakers/2005/DM_2005_Ch3.pdf
 - Active mines and exploration sites in New Mexico
<https://geoinfo.nmt.edu/staff/mclemore/activemines19.xlsx>
 - New Mexico Mines Database
<https://geoinfo.nmt.edu/staff/mclemore/MinesinNewMexico.html>
- REE and critical minerals in New Mexico
 - Preservation and databases of REE and other critical minerals in NM (funded by USGS: G19AS00009, 8/19-7/20; G20AP00105, 8/20-7/21; G21AS00007, 8/21-7/22, G22AS00033, 8/22-6/23)
 - Mapping REE in Gallinas Mountains (funded by USGS G19AC00258, 7/19-8/21, completed,
<https://geoinfo.nmt.edu/publications/openfile/details.cfm?Volume=617>)
 - Mapping REE in Cornudas Mountains (funded by USGS G20AC00170, 7/20-8/22, completed,
<https://geoinfo.nmt.edu/publications/openfile/details.cfm?Volume=619>)
 - Mineral-Resource Potential of Southwestern New Mexico, including critical minerals (funded by Bureau of Land Management, contract 140L0321P0009-FE; June 2021-Feb 2022, completed)
 - Carbon ore, rare earth, and critical minerals (Core-CM) assessment of San Juan River-Raton coal basin, New Mexico, DOE (DE-FE0032051, 10/01/2021 – 12/30/2024) <https://geoinfo.nmt.edu/staff/mclemore/REEinCoalWeb.html>
 - Geochemistry of the Laramide Porphyry Belt, Arizona and New Mexico (funded by the USGS: G23AC00054-00, 689204, 1/3/2023-1/2/2025)

- Critical minerals in mine wastes (funded by USGS, G22AC00510, 9/1/22-8/31/24).
- Geochemistry and detailed mapping of the Black Hawk arsenide-5 element vein system (funded by USGS, G23AC00373, 6/1/23-5/31/26).
- Geochemical reanalysis of NURE samples from the Colorado Plateau, New Mexico, Utah, Colorado, and Arizona (funded by USGS, G23AC00561, 9/1/23-7/31/26).
- Inventory and Characterization of Inactive/abandoned mills, smelters, tailings funded by USGS, G23AC00561, 9/1/23-8/30/25).
- Alkaline-related gold-tellurium (Te) deposits in NM and CO
 - Te in New Mexico
 - Te in igneous related rocks (cooperative project with the USGS)
- Mining districts in New Mexico
 - <https://geoinfo.nmt.edu/staff/mclemore/projects/MiningDistricts.html>
 - Summary of mining districts
 - Metals production by mining district
- Geology and mineral deposits of the Jicarilla Mountains, Lincoln County, NM
- State parks—papers in Southern Parks book, working on scenic trip
- Geology, mining history, and mineral resources of Grant County, NM
- Placer gold deposits in New Mexico
 - Trace element analyses of placer gold deposits
- Environmental impacts of mining in New Mexico
 - AML Project
 - USGS mine wastes characterization
 - USGS mine wastes inventory

PUBLICATIONS

McLemore has written over 400 publications concerning the geology of New Mexico. See <http://geoinfo.nmt.edu/staff/mclemore/publications.html> for full list

Selected Recent Publications

McLemore, V.T., 2023, Rare Earth Elements and Critical Minerals in Late Cretaceous Coal and Related Strata in the San Juan and Raton Basins, New Mexico: *Lite Geology*, v. 51, https://geoinfo.nmt.edu/publications/periodicals/litegeology/51/lg_v51.pdf

McLemore, V.T., Iverson, N., Woodard, M., Attia, S., and Owen, E.J., 2023, Critical Mineral Resources in the Cornudas Mountains, Otero County, New Mexico: *New Mexico Geological Society, Guidebook 73*, p. 132-141.

Owen E.J. and McLemore, V.T., 2023, Pre-conference field trip two: Cornudas Mountains: *New Mexico Geological Society, Guidebook 73*, p.

McLemore, V.T., 2022, Mineral Resources of the Rosedale mining district, Socorro County, New Mexico: *New Mexico Geological Society, Guidebook 68*, p. 375-383, https://nmgs.nmt.edu/publications/guidebooks/downloads/72/72_p0375_p0383.pdf

Haft, E.B., McLemore, V.T., Rämö, O.T., and Kaare-Rasmussen, J., 2022, Geology of the Cambrian-Ordovician Lemitar Carbonatites, Socorro County, New Mexico: *Revisited: New*

- Mexico Geological Society, Guidebook 68, p. 365-373,
https://nmgs.nmt.edu/publications/guidebooks/downloads/72/72_p0365_p0373.pdf
- Dietz, H.M. and McLemore, V.T., 2022, Geochemistry of the U-Th-REE mineralized Tajo granite, Socorro County, New Mexico: New Mexico Geological Society, Guidebook 68, p. 357-363, https://nmgs.nmt.edu/publications/guidebooks/downloads/72/72_p0357_p0363.pdf
- McLemore, V.T., Owen, E., Kelley, S.K., Zimmerer, M., Haft, E. and Gysi, A., 2022, Structural and chemical controls of REE mineral deposits in the Gallinas Mountains (Gallinas District), Lincoln County, New Mexico, USA; in Christie, A.B. (ed.), Proceedings of the 16th SGA (Society for Geology Applied to Mineral Deposits) Biennial Meeting, 28-31 March 2022: p. 235-238. [SGA 2022 Proceedings June 2022 - Dropbox](#)
- McLemore, V.T., Kelley, S., and Zimmerer, M., 2022, Rare earth element deposits in the Gallinas Mountains, Lincoln County, New Mexico: Lite Geology, issue 50, https://geoinfo.nmt.edu/publications/periodicals/litegeology/50/lg_v50.pdf
- McLemore, V.T., Iverson, N., Woodard, M., Attia, S., Dietz, H., Owen, E., Haft, E.B., Childress, T., Trivitt, A., and Kelley, R., 2022, Geology and mineral deposits of the Cornudas Mountains, Otero County, New Mexico: New Mexico Bureau of Geology and Minerals Resources, Open-file Report OF-619, 151 p., [Open-file Report - 619 \(nmt.edu\)](#)
- McLemore, V.T., Haft, E., Owen, E., Woodard, M., and Iverson, N., 2023, Mineralogy and Geochemistry of Selected Rare Earth Elements (REE) Deposits in the North American Cordilleran alkaline-igneous belt in New Mexico: Minexchange, 2023 SME Annual Conference Technical Program, preprint 23-052, 7 p.
- Badonie, M., Newcomer, J., Shaver, S., and McLemore, V.T., 2023, REE in coal and associated strata in the San Juan and Raton Basins, New Mexico: Minexchange, 2023 SME Annual Conference Technical Program, preprint 23-055, 5 p., <https://geoinfo.nmt.edu/staff/mclemore/documents/23-055.pdf>
- Stafford, K. and McLemore, V.T., 2023, Critical Minerals in Laramide Porphyry Deposits of Southwest New Mexico: Minexchange, 2023 SME Annual Conference Technical Program, preprint 23-054, 3 p.
- Cherotich, S., and McLemore, V.T., 2023, Characterization and Origin of the REE-bearing Magmatic-hydrothermal breccia pipes in the Gallinas Mountains, Lincoln County, New Mexico: Minexchange, 2023 SME Annual Conference Technical Program, preprint 23-056, 4 p.
- Kopačková-Strnadová V., Rapprich V., McLemore V., Pour O. and Magna T., 2021, Quantitative estimation of rare earth element abundances in compositionally distinct carbonatites: Implications for Proximal Remote-Sensing Prospection of critical elements. *International Journal of Applied Earth Observation and Geoinformation*, accepted.
- Ackerman, L., Rapprich, V., Polák, L., Magna, T., McLemore, V.T., Pour, O., and Čejková, B., 2021, Petrogenesis of silica-rich carbonatites from continental rift settings: a missing link between carbonatites and carbonated silicate melts? *Journal of Geosciences*, v. 66 (2021), issue 2, p. 71 – 87 DOI: <http://dx.doi.org/10.3190/jgeosci.320>, <http://www.jgeosci.org/detail/jgeosci.320>
- McLemore, V.T., 2021, Potential Lithium Resources in New Mexico: SME Annual Meeting, Preprint 21-61, https://geoinfo.nmt.edu/staff/mclemore/documents/21_061.pdf
- McLemore, V.T., 2021, Episyenites in the Zuni Mountains, Cibola County, New Mexico—new

- interpretations: New Mexico Geological Society, Guidebook 67, p. 129-136,
https://nmgs.nmt.edu/publications/guidebooks/downloads/71/71_p0129_p0136.pdf.
- McLemore, V.T., 2021, Uranium deposits in the Poison Canyon Trend, Ambrosia Lake Subdistrict, Grants Uranium District, McKinley and Cibola Counties, New Mexico: New Mexico Geological Society, Guidebook 67, p. 159-170,
https://nmgs.nmt.edu/publications/guidebooks/downloads/71/71_p0159_p0170.pdf.
- McLemore, V.T., Frey, B., Hayek, E.E., Hettiarachchi, E., Brown, R., Chavez, O., Paul, S., and Das, M., 2021, The Jackpile-Paguete uranium mine, Grants Uranium District: Changes in perspectives from production to superfund site: New Mexico Geological Society, Guidebook 67, p. 183-194,
https://nmgs.nmt.edu/publications/guidebooks/downloads/71/71_p0183_p0194.pdf.
- McLemore, V.T., 2020, Rare Earth Elements (REE) in Proterozoic peralkaline igneous rocks (Pajarito Mountain) and pegmatites in New Mexico: SME Annual Meeting, Preprint 20-97, 9 p.
- McLemore, V.T., Smith, A., Riggins, A.M., Dunbar, N., Rämö, O.T., and Heizler, M.T., 2020, REE-bearing Cambrian-Ordovician episyenites and carbonatites in southern and central New Mexico, USA, in Koutz, F.R. and Pinnell, W.M., eds. Vision for discovery: Geology and ore deposits of the Great Basin: Geological Society of Nevada, 2020 Symposium Proceedings, p. 411-428,
<https://geoinfo.nmt.edu/staff/mclemore/projects/mining/REE/documents/McLemore.pdf>.
- McLemore, V.T., 2020, Critical minerals in New Mexico; work needed to realize resources: Mining Engineering, v. 72, no. 2, pp. 31-31,
<https://me.smenet.org/abstract.cfm?preview=1&articleID=9501&page=31>
- McLemore, V.T., 2018, Rare Earth Elements (REE) Deposits Associated with Great Plain Margin Deposits (Alkaline-Related), Southwestern United States and Eastern Mexico: *Resources*, 7(1), 8; 44 p., doi:[10.3390/resources7010008](https://doi.org/10.3390/resources7010008); <http://www.mdpi.com/2079-9276/7/1/8> link <http://www.mdpi.com/2079-9276/7/1/8> (international publication)
- Haft, E.B., McLemore, V.T., Rämö, O.T., and Kaare-Rasmussen, J., 2022, Geology of the Cambrian-Ordovician Lemitar Carbonatites, Socorro County, New Mexico: Revisited: New Mexico Geological Society, Guidebook 68, p. 365-373,
https://nmgs.nmt.edu/publications/guidebooks/downloads/72/72_p0365_p0373.pdf
- Dietz, H.M. and McLemore, V.T., 2022, Geochemistry of the U-Th-REE mineralized Tajo granite, Socorro County, New Mexico: New Mexico Geological Society, Guidebook 68, p. 357-363, https://nmgs.nmt.edu/publications/guidebooks/downloads/72/72_p0357_p0363.pdf
- McLemore, V.T., Iverson, N., Woodard, M., Attia, S., Dietz, H., Owen, E., Haft, E.B., Childress, T., Trivitt, A., and Kelley, R., 2022, Geology and mineral deposits of the Cornudas Mountains, Otero County, New Mexico: New Mexico Bureau of Geology and Minerals Resources, Open-file Report OF-619, 151 p., [Open-file Report - 619 \(nmt.edu\)](https://www.nmt.edu/open-file-report-619)

STUDENT THEISES DIRECTED OR CO-DIRECTED see

http://geoinfo.nmt.edu/staff/mclemore/publications/documents/Ginger_Student_Support.pdf

ACCOMPLISHMENTS

- Inducted into the New Mexico Mining Hall of Fame, August 2023
- SME Environmental Distinguished Service Award, February 2020

- SME/AIME Environmental Stewardship Distinguished Service Award, February 2018
- Association of American State Geologists (AASG) Charles J. Mankin Memorial Award 2018 for McLemore, V.T., Timmons, S., and Wilks, M., eds., 2017, Energy and Mineral deposits in New Mexico: New Mexico Bureau of Geology and Mineral Resources, Memoir 50 and New Mexico Geological Society, Special Publication 13
- Promoted to Principal Senior Economic Geologist, August 2017
- Honorary Member NMGS, September 2016
- NMIMT Service Award for 40 years of service 2020
- SME (Society Mining, Metallurgy, and Exploration) Environmental Division 2014-2015 Chair Award
- Geoscience Information Society (GIS) Best Guidebook Award for 2001 for Lawton, T. F., McMillan, N. J., McLemore, V. T., Austin, G., and Barker, J. M. eds., 2001, Southwest Passage, A Trip through the Phanerozoic: New Mexico Geological Society Guidebook 51.
- American Institute of Professional Geologists 2000, Editor 2001-2003, Vice-president 2007, editor 2012
- Attended the Penrose Conference on Fractures and Fluid Flow, September 1997 in New Mexico (presented a poster).
- Attended the Penrose Conference on Anorthosites, August 1988 in Wyoming (presented a poster).
- Awarded stipend by the New Mexico Mining Association for best student paper entitled "Mineralization and alterations of the Center-Carlisle mine area, Steeple Rock district, Grant County, New Mexico: Preliminary observations" October 1990, September 1992 entitled "Alteration and mineralization of the Steeple Rock district, New Mexico"; and October 1993 entitled "Geology and Geochemistry of the Mineralization and Alteration in the Steeple Rock district, New Mexico and Arizona."
- Awarded International Mining Days Scholarship 1990-1992 University of Texas at El Paso.
- Judged New Mexico State Science Fair (1994, 1996, 1997, 1998, 2000), Regional Science Fair (1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2003), Socorro Science Fair (1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1998), Magdalena Fair (1993), Junior Academy of Science Papers (2002-2022)
- I was awarded Honorable Mention for a science fair project in the Baltimore Metropolitan Science Fair in the spring of 1971. I entered the fair in 1972.
- I worked on the NMIMT college newspaper during the fall semester, 1973, in layout.
- I worked during the summer of 1975 as an exploration geologist with a gas company. I compiled maps, cross-sections, structural and isopach maps, and well logs to evaluate certain properties and to determine favorable drilling sites.
- Research assistantship, New Mexico Bureau of Mines and Mineral Resources 6/79-6/80.

OUTREACH ACTIVITIES

- The case of the scarlet mineral: mineral identification
- The importance of minerals to New Mexico: where they are found and how they are used
- Gold panning in New Mexico
- Edible rocks: rock identification
- Mineral resources in New Mexico

- Salt and turquoise, how ancient cultures were affected by geology
- Geology of state parks in New Mexico
- Mining and mineral resources in New Mexico (metals, uranium, industrial minerals, rare earth elements)
- Critical minerals in New Mexico

LABORATORY MANAGING

Economic Geology Lab ([Economic Geology Laboratory - NMBGMR \(nmt.edu\)](http://www.nmbgmr.nmt.edu))

DATABASES MANAGING

NURE data

New Mexico Mines Database

Geochemistry of mining districts in NM

Collection and catalog of rocks and ores from NM mining districts

Production statistics

Gallinas Mountains

PARTICIPATION ON COMMITTEES, COMMISSIONS (*PRESENT)

1. * **Section Editor-in-Chief SME Mining, Metallurgy and Exploration (MM&Ex) journal**
[Mining, Metallurgy & Exploration - Society for Mining, Metallurgy & Exploration \(smenet.org\)](http://www.smenet.org), 2018-present
2. ***Member New Mexico Mining Commission 2015 to present**
3. NM Environment Department—Copper Rules Advisory and Technical Committees (2012)
4. *New Mexico Geological Society—Fall Field Conference Committee 1989, 1990, 1991, 1992, 1993, 2000, 2001, 2002, 2012, 2021, 2023
6. ***Thesis committees** (NMIMT)— see
http://geoinfo.nmt.edu/staff/mclemore/publications/documents/Ginger_Student_Support
7. Undergraduate projects—Heavy minerals-Red River, NM, Spring semester (Meghan Jackson), Trace element analyses of molybdenite from the different ore types at Questa, New Mexico (Mike Breese), Geochemistry of minette, Burro Mountains (Kathleen Boyer), Mines databases in NM (Christian Krueger)
8. SME Publications Committee (1989-1993, 2010-2012), Education Committee (vice chairman 1993-1994, chairman 1994-1997, past-chairman 1998-2000), Executive Committee Environmental Division, ***Government and Public Affairs Committee (2018-present)**
9. Society for Luminescent Microscopy and Spectroscopy, Chairman Awards Committee (1993-1998, member 1998-2005).
10. NMIMT—Sabbatical Committee (1993-1995).
11. Sigma XI/NMIMT Chapter—Treasurer (1994-1995, President-elect 1995-1996, President 1996-1998, Past President 1999-2000)
12. Tenure committee—Nelia Dunbar (1995—1998), Marc Wilson (1989-1990), Virgil Lueth (1990-1995)
13. Coming Events Editor—Society for Exploration Geochemistry (1996—2012)
14. *ADTI (Acid Drainage Technology Initiative-MMS) Sampling and monitoring committee, member of the Steering Committee.

15. Editor, American Institute of Professional Geologists
16. American Society for Surface Mining and Reclamation, organizing committee, annual meeting, June 2001 2018-present

GRANTS AND CONTRACTS (*bold active grants)

- 1982—U. S. Department of Energy, Uranium Occurrences in New Mexico
- 1983—U. S. Bureau of Land Management, Mineral Resources of Torraine County
- 1983—U. S. Bureau of Land Management, Mineral Resources of northern Rio Puerco Resource Area
- 1985—U. S. Bureau of Land Management, Mineral Resources of Rio Puerco Resource Area
- 1989—U. S. Department of Energy, Radon potential in New Mexico (\$5,000)
- 1992—Mt. Royal Mining Corp., Geology and geochemistry of the Steeple Rock mining district, New Mexico (\$5,000)
- 1993—U.S. Bureau of Reclamation, A study of the metals loading of the Pecos River, New Mexico (approx \$5,000, co-PI)
- 1995—Phelps Dodge Mining Co., Geochemistry and geochronology of the Chino and Tyrone copper porphyry systems, NM
- 1997—U. S. Geological Survey, Mineral resource inventory of Sierra and Otero Counties (\$6,525)
- 1997—Mira Corp. for U. S. Army Corp of Engineers, Mineral Resources of the McGregor Range, Ft. Bliss, Otero County, New Mexico, precious metals (\$119,617, entire contract PI Ron Broadhead for \$303,806)
- 1999-2000—Geology and mineral resources of the Wild Horse Mesa area, Grant County, New Mexico. \$1,500 from Joe Aeillo and Associates.
- 1999-2000—Acid Drainage Technology Initiative, Workbook on Acid Drainage Remediation, Introduction and Sampling and Monitoring Chapters. \$3,000.
- 2000—Soils Geochemistry in Semiarid and Arid environments, Office of Surface Mining short course, August 7-11, 2000. \$1,800.
- 2000—Site Characterization, Army Corp of Engineers, Short Course, St. Louis, November, \$2,300.
- 2001—New Mexico State Land Office, Mineral Resource Assessment of Luna County, \$15,000.
- 2001—Heavy Minerals and Heavy Mineral Alteration in Sediments along the upper Red River, Taos County, Molycorp, Inc., \$3,250
- 2001—Trace element analyses of molybdenite from the different ore types at Questa, New Mexico: Molycorp, Inc., \$800
- 2001—USGS Central Region surveys and analysis project; Mineral deposit databases of New Mexico, \$25,000
- 2002—US Army Corps of Engineers, Database of mines in Sierra and Otero Counties (\$15,000)
- 2003-2009—University of Utah—Molycorp Questa Weathering and stability project, ~\$4.2 million
- 2011-2012—Rare earth element (REE) potential and origin of the Cambrian-Ordovician syenites/episyenites in the Caballo and Burro Mountains, southern New Mexico, V.T. McLemore and N. Dunbar, PIs, 2012 USGS MRERP, \$60,000

2011-2012—National Shooting Sports Foundation, \$6000 grant to the New Mexico Tech Shooting Sports Club (New Mexico Tech Rifle Team)

2015-2016—Jicarilla Apache Nation to complete an Assessment of rare earth elements at Stinking Lake, New Mexico, ~\$52,000

2016-2017—Midway Foundation Grant, grant to the New Mexico Tech Shooting Sports Club (New Mexico Tech Rifle Team), \$1800

2016-2017—AML Proposal to the New Mexico Abandoned Mine Lands Bureau, PIs Drs. Mojtabai, McLemore and Walder—to NMMMD, \$160,000 for 2 yrs

2016-2017—NM State Land Office Minerals Resources—PIs Martha Cather, R. Broadhead, McLemore—to NMSLO, ~\$48,000

2019-2020—USGS PRIORITY 3, IDENTIFY CRITICAL MINERAL RESOURCES, Data Preservation of REE Mines and Occurrences in New Mexico, \$35,000

2019-2021—USGS Critical Minerals, Rare earth elements (REE) deposits in the Gallinas Mountains, Lincoln and Torraine Counties, central New Mexico \$125,000

2020-2021—USGS PRIORITY 2, Identify Critical Mineral Resources, Data Preservation of REE Mines and Occurrences in New Mexico, \$35,000

2020-2022—Investigation of rare earth elements (REE) deposits in the Cornudas Mountains area, Trans-Pecos Tertiary Alkaline Rocks, New Mexico and Texas \$100,000

2021-2022—USGS PRIORITY 2, Identify Critical Mineral Resources, Data Preservation of REE Mines and Occurrences in New Mexico, Year 3, \$33,000

2021-2023—DOE DE-FOA-0002364 Carbon Ore, Rare Earth, and Critical Minerals (Core-CM) Assessment of San Juan River-Raton Coal Basin, New Mexico (~\$800,000)

2021-2022—BLM, Mineral-Resource Potential of Southwestern New Mexico (\$107,000)

2022-2024—USGS, Critical minerals in minewastes, U.S. Geological Survey (\$243,488)

2023-2025—USGS, Geochemistry of the Laramide Porphyry Belt, Arizona and New Mexico (subcontract with Arizona Geological Survey) (\$300,000)

OTHER PERTINENT SKILLS

- Run FAAS and GAAS (flame and graphite furnace atomic absorption spectrometer)
- Run XRF and XRD (X-ray fluorescent spectrometer and diffraction) instruments
- Run PXRF instrument (portable or hand held XRF)
- Perform various wet chemical analytical methods
- Run electron microprobe
- Various computer programs, including GIS ARCMAP, ACCESS
- Sampling and sample preparation
- Surveying
- Certified MSHA Part 48 New Miners Training and First Aid instructor
- Preparing budgets
- Project manager

Very active in the New Mexico Shooting Sports Assoc. (NMSSA), 4H Shooting Sports 1984-2002 (Leader Socorro Junior 4H Gun Club), National Rifle Association of America (Certified Rifle Coach, Basic instructor rifle, pistol, Home firearms safety, training counselor, 1984-present), New Mexico Game and Fish Department (1988-2002), and Civilian Marksmanship

Program State Director for NM (1998-present). NMSSA Presidents Award 1988. NMSSA Distinguished Coach Award 1994. National Record for Women's Team 300 yd High Power Rifle 1989. Member of the Women's International Randall Team (smallbore rifle) 1998-2002, 2004-2008, 2010-2022). Member of the International Dewar Team (smallbore rifle), 2010-2021). Member of the International Wakefield Team (smallbore rifle), 2010-2022). Coached winning Whistler Boy Smallbore Rifle Team 1998, National Matches; Women's National Record in the prone metallic team sights (.22 rifle), won the National Metallic Team Sights Prone Championship, Camp Perry 2003. Member of the Women's International Goodwill Randall Team to England in 2001, 2009, 2016, Member of the Roberts International Team to England in 2009, 2nd place grand aggregate in the 2010 NRA Metric Smallbore Rifle Prone National Championship, 2010. 2nd overall NRA National Smallbore Rifle National Championship 2021.

EMPLOYMENT RECORD

From June 1980 to present (tenured 1986), New Mexico Bureau of Geology (formerly Mines) and Mineral Resources, New Mexico Institute of Mining and Technology, Socorro, NM 87801 (Frank Kottowski (1980-1991), Charles Chapin (1991-1998), Peter Scholle (1998- 2011), Greer Price (2011-2017), Matt Rhoades (2017), Nelia Dunbar (2017-present))

Position: Geologist (1980-1993), received tenure in 1986, Senior Economic Geologist (1993-present), Minerals Outreach Liaison (2000-present)

Joint appointment: Adjunct professor, Department of Earth and Environmental Sciences (1995-present), Department of Mineral Engineering (2000-present), New Mexico Institute of Mining and Technology

From June 1979 to June 1980

Employer: Frank Kottowski, NMBMMR, Socorro, NM 87801

Position: Graduate assistantship

From September 1977 to May 1979

Employer: Chris Rautman, NMBMMR, Socorro, NM 87801

Position: Literature search

From May 1979 to September 1979

Employer: Joe Kappler, Urangesellschaft, USA, Inc. 2160 S. Holly, Denver, CO 80222

Position: Assistant field geologist

From July 1976 to May 1977

Employer: Robert Clay, Tax Mapping Supervisor, Bataan Memorial Building, Santa Fe, NM (office in Socorro)

Position: Draftsman - plotted tax properties for Socorro County Assessor's Office

From June 1976 to July 1976

Employer: George Austin, NMBMMR, Socorro, NM 87801

Position: Lab Assistant - clay analysis, x-ray work, and particle size analysis

From January 1976 to May 1976

Employer: Alan Krug, NMIMT, Socorro, NM 87801

Position: Teaching assistant (taught surveying lab)

From September 1975 to December 1975

Employer: Dr. Marc Bodine, NMIMT, Socorro, NM 87801

Position: Lab assistant (analyzed rock and water samples on the atomic absorption spectrometer, prepared samples and standards)

From July 1975 to September 1975

Employer: Natural Gas Pipeline Company of America, Erv Clower, Post Oak Tower,
Westheimer Road, Houston, TX 77001

Position: Exploration geologist

From September 1973 to June 1975

Employer: Gale Billings (9/73 to 5/74), Dick Beane (5/74 to 8/84), Vern LeFabre (8/74 to 6/75),
NMIMT, Socorro, NM 87801

Position: Lab technician (ran atomic absorption spectrometer)

From August 1972 to August 1973

Employer: Mrs. Pat Rich, Spiegels, Baltimore National Pike, Baltimore, MD 21207

Position: Evening supervisor, salesperson

Reason for leaving: Left for college

From January to April 1973 and from January to April 1972

Employer: H & R Block, Baltimore National Pike, Baltimore, MD 21207

Position: Receptionist, duplicating machine operator

Reason for leaving: End of tax season