

**NEW MEXICO
BUREAU OF MINES
AND
MINERAL RESOURCES**

**ANNUAL REPORT
1949-1950**

NEW MEXICO SCHOOL OF MINES

E. J. Workman, President

STATE BUREAU OF MINES AND MINERAL RESOURCES

Eugene Callaghan, Director



ANNUAL REPORT

FOR THE FISCAL YEAR ENDING
30 JUNE 1950

SOCORRO

1951

THE REGENTS NEW MEXICO SCHOOL OF MINES

MEMBERS EX-OFFICIO

The Hon. Edwin L. Mechem *Governor*
Tom Wiley *Superintendent of Public Instruction*

APPOINTED MEMBERS

James H. Russell, *President* Santa Fe
Thomas Cramer, *Secretary-Treasurer* Carlsbad
Thomas Ewing Dabney Socorro
Cooper Shapley Deming
George Townsend Harley Carlsbad

To the Board of Regents:

I have the honor of transmitting to you the Annual Report of the Bureau of Mines and Mineral Resources for the year ending June 30, 1950, as required by Section 3, Chapter 115 of the session laws of the 8th State Legislature, approved March 4, 1927.

Respectfully submitted,
E. J. WORKMAN,
President

Duties and Objectives of the Bureau of Mines and Mineral Resources

BASICALLY, THE PURPOSE of the Bureau of Mines and Mineral Resources, which was established by the New Mexico Legislature in 1927, is to secure accurate information on all types of mineral resources in the State and on all phases of their utilization, and to make this information available to all interested citizens, companies, organizations, and to State and Federal agencies. In this capacity, the Bureau has an important role to play in national defense because it supplements the defense work of Federal agencies in the mineral field. The Bureau is the only State organization charged with the duty of investigating, studying, and reporting on mineral resources such as oil and gas, coal, ground water, and metallic and nonmetallic minerals. The Bureau has no regulatory or law-enforcement functions. The Bureau never has had sufficient funds to perform fully the duties assigned to it by law.

In general, it may be said that most of the mineral deposits that can be found easily on the surface have been discovered. It is recognized that all the knowledge and tools which geologic and engineering sciences have developed must be brought to bear upon the problem of finding new or additional deposits. Further, it is realized widely that the development of basic information, such as regional and local geologic maps and mineral studies, is a legitimate function of the State and a duty to its citizens. In New Mexico the mineral industry is of such vital importance to the State that its maintenance through the finding of new and additional deposits to take the place of those that are depleted is absolutely necessary. The continued flow of these mineral resources is also a necessity to the defense and well-being of our nation. As a single instance, the potash of New Mexico, the principal source in the Western Hemisphere, is absolutely necessary to the maintenance of the intensive agriculture that has made America the best-fed nation and a source of foodstuffs for the world.

The Bureau has recognized the duties outlined herewith and is performing them to the limits of its capacities. It is apparent that the very small technical staff and resources now available permit the performance of but a small part of these duties in an adequate manner. The State Bureau of Mines and Mineral Resources should:

1. Prepare a geologic map of New Mexico.
2. Prepare and have for distribution geologic maps of all parts of the State at a scale of one inch to the mile or larger.
3. Prepare detailed maps of individual mineral deposits or of areas recommended for prospecting on appropriate scales.
4. Prepare maps and reports on school or other State lands for administrative use and for guidance in formulating land sales and leasing policy.
5. Prepare maps and reports on a regional inventory of ground-water resources, as well as reports on intensive ground-water studies and techniques of water-finding.
6. Prepare oil, gas, and coal maps and pertinent diagrams and reports that will aid in exploration for these materials.
7. Compile reports on individual mineral commodities or groups of commodities for the State.
8. With the aid of paleontologic and other techniques establish stratigraphic sequences and correlations throughout the State.
9. Provide assay, chemical, mineralogical, and metallurgical laboratories for testing materials for citizens of the State.
10. Provide information requested by persons or firms contemplating establishment of industries in the State.
11. Prepare basic reports for specific areas of land utilization such as irrigation districts or recreational areas.
12. Cooperate with State and Federal organizations carrying on work having to do with mineral resources of the State.

13. Prepare booklets on State parks or other recreational areas for use by tourists or other citizens.
14. Prepare educational booklets and maps on mineral resources and their conservation for use by the schools.
15. Keep up-to-date files of information and pictures for accurately answering letters and requests.
16. Prepare statistical and economic reports on mineral resources.
17. Prepare bibliographies of geologic and mineral resource literature concerning the State.
18. Investigate the seismicity of New Mexico and other factors affecting engineering structures.
19. Study application of geophysical techniques to geologic and engineering problems.
20. Publicize the mineral industry of New Mexico through talks before engineering and scientific societies and before lay groups.
21. Preserve records such as mine maps, production records, borehole samples and cores from oil well tests and others.
22. Maintain a museum of New Mexico minerals and raw materials that will serve as a basis for exhibits for State and other fairs.
23. Provide adult education for miners, prospectors, and other interested citizens.
24. Provide in-service training for mineral industry students.

Services

REQUESTS FOR THE MANY SERVICES the Bureau offers increased during the year. More than 300 persons came to the Bureau offices at Socorro for consultation with Bureau personnel and for information and publications. Included were professional engineers and geologists, owners of properties, prospective investors, miners, prospectors, and many others. The office at Artesia had numerous visitors also. Many telephone requests were answered, and more than 4,000 letters written. The sales of maps and publications increased so that more than 2,000 each of bulletins, maps, and well logs were distributed. Almost 2,000 circulars and annual reports were distributed free of charge. Also some 1,300 publications and maps were issued free to school libraries, institutions, and to surveys of other states and foreign countries on an exchange basis. Publications received in exchange are deposited in the library of the School of Mines and thus become a part of the educational heritage of New Mexico.

For the benefit of those interested in the discovery of more oil and gas, a rapidly growing sample library representing 1,731 oil and gas well tests, as of June 30, is maintained at Socorro. These samples represent more than 400,000 feet of bore hole drilled and are largely from wildcat tests drilled outside of established fields. Log strips for 631 wells have been plotted and are available for consultation at Socorro. More than 6,200 drillers' logs are on file. The office at Artesia maintains a duplicate set of drillers' logs, as well as electrical logs, maps, reports and statistics which are immediately available in the most productive area of the State. The petroleum geologist maintains the facilities in Socorro. The petroleum engineer maintains the office at Artesia and represents the Bureau at Lea County Operators Committee meetings, Oil and Gas Conservation Commission hearings, Land Office lease actions, and meetings of the New Mexico Nomenclature Committee. The knowledge thus gained makes the Bureau more useful to all citizens. The petroleum engineer also cooperates with the Lea County Operators Committee in compiling the annual statistics of

each producing well in the State. The compilation is published each year by the Bureau and thus made available to the public.

The engineers and geologists of the Bureau are called upon by prospectors and small operators for advice and assistance, as well as by those looking for likely prospects and mines to explore or to operate. These requests are handled by actual visits and examinations in the field, consultations in the office, or by letter or telephone. Brief reports, prepared on field examinations, are filed for public reference. Numerous samples of clay, perlite, and limestone were collected and tested. Prospectors and others make use of the chemical and assay laboratories and more than 550 assays and analyses were made, as well as 1,000 qualitative determinations. Prevailing fees are charged for assays and analyses though qualitative tests and mineral determinations are free of charge.

Through issuing and distributing publications the Bureau draws attention to the possibilities as well as the actualities of mineral production in New Mexico. Scientific papers on New Mexico resources are given at State and National meetings. The Press is supplied with factual data and a file of pictures suitable for publicity use is being built up. An extensive and carefully prepared exhibit, based in part on contributions from mining and oil companies, is presented each year at the State Fair.

The Bureau also participates in educational activities in the State. It cooperates closely with the University of New Mexico and other institutions of higher learning. Talks were given to teachers assembled for the Conservation Workshops at St. Joseph College, Highlands University, and Eastern New Mexico University. Inquiries from teachers and students both in New Mexico and elsewhere were answered and small sets of minerals were sent to all students who asked for them. The reports and maps published by the Bureau are source material for college students and teachers, and college students also consult the files and the personnel of the Bureau. Through its Field Assistance Fellowship program and its hiring of college students for various tasks, the Bureau also provides in-service training in mineral resource engineering and geology.

Research Activities

THE PROCESS of securing basic information on the geology and mineral resources of the State and of synthesizing this information for use by the interested public constitutes the research activity of the Bureau. The permanent staff must divide its time between service activities and research. Temporary staff members devote to research all of the brief time they are employed by the Bureau. The number of research projects was expanded greatly during the year, and those projects previously undertaken were continued. Most projects require at least two field seasons for completion. Projects in various categories are described briefly below. The accompanying map shows the location of the field mapping in progress or initiated during the year.

MINERAL FUELS

The knowledge of oil and gas fields in New Mexico is expanding so rapidly that parts of Bulletin 18, "The Oil and Gas Resources of New Mexico," issued in 1942, are out-of-date. Petroleum geologists in private practice who are authorities on each field have been invited to prepare chapters or articles on a number of the most important fields or pools.

METALLIC MINERALS

Mr. E. C. Anderson continued preparation of text for a bulletin on "Metallic Mineral Resources and Mining Districts of New Mexico." This compilation is in demand as a previous bulletin on this subject is out of print.

NONMETALLIC OR INDUSTRIAL MINERALS

Clay: Field and laboratory studies of the clay resources of New Mexico were continued, though hampered by lack of laboratory space and equipment.

Raw materials for portland cement: Preliminary field examinations were made and laboratory work was started on limestones and shales for possible use in portland cement.

Perlite: Volcanic glass commercially known as perlite which is finding a rapidly growing market, especially in the building

trades, is the subject of an intensive study of geology of its occurrence, its chemical and microscopic characteristics, and its behavior under thermal or "popping" treatment. Detailed mapping of a deposit near Magdalena in Socorro County was started and mapping and sampling of other properties was planned. Preliminary laboratory studies were made.

BASIC GEOLOGY

Geological maps are fundamental material for those engaged in finding mineral deposits of all sorts. The projects listed below were in progress or completed during the year. The numbers refer to the map at the end of this report.

1. *Costilla and Latir Peak quadrangles*: Field work on these two quadrangles was completed by Philip F. McKinlay, of the Bureau staff, and the maps are being prepared for publication in cooperation with the U. S. Geological Survey. The area includes part of the rugged Sangre de Cristo Mountains and part of the San Luis Valley to the west. The mountains contain a variety of rocks of pre-Cambrian, Permian, Tertiary, and Quaternary ages. The valley area is underlain by volcanic rocks and gravels. Materials of economic interest are the ground water of the valley, gravels, granite, pegmatite, graphite, and minor gold deposits.

2. *Questa and Eagle Nest quadrangles*: Field work on these quadrangles was also completed by Philip F. McKinlay in cooperation with the U. S. Geological Survey. These quadrangles likewise cover parts of the Sangre de Cristo Mountains and of the San Luis Valley. A wide variety of pre-Cambrian, Paleozoic, Mesozoic, and Tertiary rocks in a very complex structural pattern are included in this area. Mineral raw materials of economic importance in this area are molybdenum from the noted Questa mine, as well as occurrences of gold, zinc, copper, various igneous rocks, and ground water. Both areas, 1 and 2, are noted for scenery and recreational facilities.

3. *Manzano Mountains*: Field work was completed by J. T. Stark and W. L. Basham assisted by James Dorman, all of Northwestern University, on the geology of the pre-Cambrian rocks of the Manzano Mountains in a strip north of Abo Pass. Materials of possible economic interest include granite and quartzite.

4. *Capitan quadrangle*: Field work by J. E. Allen and S. M. Jones, of New Mexico School of Mines, was started on the Capitan quadrangle which covers a wide variety of rocks in an intricate structural pattern. Coal and iron, as well as precious metals and some lead and zinc, have been mined in this area.

5. *Black Range NW quadrangle*: Field work on this quadrangle which covers a mountainous area underlain almost wholly by volcanic rocks was started by David Llewellyn, of Stanford University. Precious metals and tin have been recovered from this area.

6. *Black Range NE and SE quadrangles*: Work was started by R. H. Jahns, of California Institute of Technology, on these quadrangles which cover a wide variety of rocks and mineral deposits and complex geologic structure. Deposits of the beryllium ore, helvite, as well as of tungsten, gold, silver, and the base metals occur in this area.

7. *Geologic section of the Black Range*: Field mapping by F. J. Kuellmer, of the University of Chicago, was completed on a strip extending from Kingston on the east across the Black Range to the Mimbres River. The purpose of this project was to gain an understanding of the structure and variety of the rocks in the Black Range as a guide to further geologic mapping and exploration for mineral deposits. A part of the famous old mining camp of Kingston is included.

8. *Sherman quadrangle*: Field work was started by Wolfgang Elston, of Columbia University, assisted by Morton Cohen, in this area of volcanic rocks in order to tie the known geology of the Silver City area to that of the Black Range. Perlite and fluorite deposits, as well as occurrences of precious metals, are included in this area.

9. *Lake Valley quadrangle*: Field work was started by H. L. Jicha, Jr., of Columbia University, assisted by F. D. Eckelmann, on this quadrangle which includes many kinds of rocks, as well as much of the Cook's Peak and Lake Valley mining districts. These districts were notable producers of silver as well as of base metals and manganese.

10. *Sacramento Mountains*: Field work was completed by L. C. Pray, of California Institute of Technology, on one and one-

half quadrangles which cover the precipitous west face of the Sacramento Mountains. This work should serve as a guide to the stratigraphy of the sedimentary rocks which extend eastward into the oil fields of eastern New Mexico. Base metal deposits occur in this area, as well as limestone, gypsum, and other materials of possible economic use.

11. *El Paso Gap quadrangle*: Field work by D. W. Boyd, of Columbia University, assisted by Richard Bateman, was started in this quadrangle for the purpose of analyzing in detail the stratigraphy of the Permian rocks which extend eastward into the oil fields.

Montgomery's area

GROUND WATER

Red beds Cu deposits

In cooperation with the Ground Water Branch of the U. S. Geological Survey the program of county-wide surveys of ground-water resources has been continued. This work is under the direction of the Federal agency. In addition to this work a number of brief reports were prepared as results of studies of ground-water conditions adjacent to several towns in New Mexico.

San Miguel County: Field work was completed by Gerth E. Hendrickson and the report prepared for editing and publication.

Eddy County: Field work was completed by Gerth E. Hendrickson and the report is being prepared.

Torrance County: Field work by Ralph E. Smith is in progress.

Socorro County: Zane E. Spiegel completed field work on the northeastern part of Socorro County and is preparing a report.

Special project in Socorro County: With funds from its regular appropriation the Bureau started a project in cooperation with the Research and Development Division, New Mexico School of Mines, for the study of techniques of water-finding. The Research Division supplied a geophysical party and equipment for study of geophysical procedures while the Bureau supplied a geologist, Mr. John F. Waldron, of Stanford University, to measure and sample wells and ascertain geological conditions of ground-water accumulation to check with the geophysical results. For reasons of economy the area selected was that in the vicinity of Socorro and extending westward to Magdalena.

Publications

ONE BULLETIN, three oil and gas reports, and the fourth annual report of the Director were published during the year.

Bulletin 29, entitled "Pre-San Andres stratigraphy and oil-producing zones in southeastern New Mexico—A progress report," was received from the press in November 1949. Information on new wells, on new oil fields, and on stratigraphy and producing zones of the pre-San Andres formations has been brought up to date by E. Russell Lloyd, prominent consulting geologist of Midland, Texas. The bulletin contains 87 pages, 10 plates, 7 figures, and a series of tables.

Comprehensive statistical reports for 1948 on all producing oil and gas wells in New Mexico were released as follows:

Oil and Gas Report 4-A, "New Mexico Oil and Gas Statistical Data for 1948," compiled by E. E. Kinney, Lea County Operators Committee, and New Mexico Oil Conservation Commission, was released in July 1949.

Oil and Gas Report 4-B, "New Mexico Oil and Gas Engineering Data for 1948," also compiled by E. E. Kinney, Lea County Operators Committee, and New Mexico Oil Conservation Commission, was ready for distribution in August 1949.

"Annual Report 4, for the Fiscal Year July 1, 1948-June 30, 1949" (includes Annual Report of State Inspector of Mines), by E. C. Anderson, Director, was released in November 1949.

Manuscripts in press or in preparation are as follows:

Oil and Gas Report 5-A, "New Mexico Oil and Gas Statistical Data for 1949," compiled by E. E. Kinney, Lea County Operators Committee, and New Mexico Oil Conservation Commission, was sent to press April 17, 1950.

Oil and Gas Report 5-B, "New Mexico Oil and Gas Engineering Data for 1949," compiled by E. E. Kinney, Lea County Operators Committee, and New Mexico Oil Conservation Commission, was sent to press April 17, 1950.

A bulletin on metallic mineral resources and mining districts of New Mexico—a revision of Bulletin 7, “The Metal Resources of New Mexico and Their Economic Features.”

A bulletin entitled, “Bibliography of Geology and Mineral Resources of New Mexico.” This bulletin will supersede Bulletin 22, “Geologic Literature of New Mexico through 1944.”

A map and text entitled, “Geology of the Costilla and Latir Peak Quadrangles, Taos County, New Mexico,” by Philip F. McKinlay, Bureau geologist, in cooperation with the U. S. Geological Survey.

A bulletin on “Pre-Cambrian Rocks and Mineral Deposits of the Picuris Area, Taos County, New Mexico,” by Arthur Montgomery.

A bulletin on “The Geology of a Part of the Sacramento Mountains in the Vicinity of Alamogordo, Otero County, New Mexico,” by Lloyd Pray.

Ground water reports prepared in cooperation with the U. S. Geological Survey and entitled (1) “Geology and Ground Water Resources of San Miguel County, New Mexico,” and (2) “Geology and Ground-Water Resources of Eddy County, New Mexico,” are almost completely prepared for publication.

Personnel

IN ORDER TO EXPAND the research work and service of the Bureau several additions and changes were made in the staff. The amount of temporary summer help was greatly increased.

Dr. Eugene Callaghan, for many years geologist with the metals and nonmetals sections of the U. S. Geological Survey, and for three and a half years professor of economic geology at Indiana University and economic geologist for the Division of Geology, Indiana Department of Conservation, was appointed Director, as of September 1949.

Mr. E. C. Anderson, who served as Director until September 1949, was appointed mining engineer to expand the services of the Bureau to miners and prospectors and to prepare special reports on various phases of the mining industry.

Dr. Robert H. Weber, who received his geologic training at Ohio State University and the University of Arizona, was appointed economic geologist, as of May 1950.

Mr. Robert A. Bieberman, who obtained his B.A. and M.A. from Indiana University, was appointed petroleum geologist in June 1950 to take the place of Mr. Richard C. Northup who resigned in February 1950 to enter private practice.

The services of Mr. Howard K. Lucas on a part-time basis were obtained in cooperation with the College Division of the School of Mines to set up properly the museum located in Brown Hall and to prepare exhibits.

On a temporary basis, the services of Professor John T. Stark, of Northwestern University, and his assistant, William L. Basham, were obtained to complete the mapping of pre-Cambrian rocks in the Manzano Mountains. Professor Richard H. Jahns, of California Institute of Technology, began the survey of two quadrangles on the east slope of the Black Range, and Mr. John F. Waldron, a graduate student at Stanford University, began a water-resource study of the area west of Socorro. Professors John E. Allen and Stewart M. Jones, of the College Division, New Mexico School of Mines, started mapping the Capitan quadrangle. Mr. Lloyd C. Pray, of California Institute of Technology, completed his field study of part of the Sacramento Mountains.

A program of field assistance fellowships for Ph.D. candidates in various leading universities was started in May and June 1950. Five candidates who were selected on the recommendations of their geology faculties were assigned projects which have been described. These men are given a per diem for the time they are in New Mexico, together with some field supervision and assistance. They are expected to prepare their material at their universities for publication. Most of these projects require two field seasons.

Plant

IN OCTOBER 1949 the offices of the Bureau were moved from exceedingly cramped quarters in the basement of Brown Hall to temporary residence in the new Research Laboratory. This move permitted the establishment of a business office, publications room, petroleum sample library room, drafting and map room, mineralogical laboratory, two geological laboratories and two engineers' offices. A small chemical laboratory has been set up in a temporary building on the campus and to this was added some space for sample preparation and testing of clays and other non-metallic materials. Assaying is done by the Bureau assayer in the College Division assay laboratory. Other facilities of the College Division and of the Research and Development Division are kindly made available to the Bureau.

Equipment for field surveying and mapping, as well as for laboratory work was almost wholly lacking early in the year. Insofar as funds permitted, alidades, plane tables, a transit, a level, petrographic microscopes, X-ray diffraction equipment, new trucks, and many other items and accessory equipment have been added. Drafting tables and equipment, plotter for aerial photographs, and other map-making aids were secured. The ultimate aim is to be equipped sufficiently well that any problem can be handled.

A design for a new building to house the minimum staff and activities of the Bureau was submitted to the President of New Mexico School of Mines. The School of Mines has been authorized to issue bonds for this construction. The Bureau is most urgently in need of integrated laboratory facilities that will not only permit the proper exercise of functions handled currently, but will permit the establishment of a testing laboratory for nonmetallic or industrial mineral materials and metallurgical tests.

Financial Statement

THE COMPTROLLER of New Mexico School of Mines, under whose supervision Bureau finances are handled, submits the following statement:

RECEIPTS AND DISBURSEMENTS

STATE BUREAU OF MINES—GENERAL

Receipts:

Carry-over from Fiscal Year, 1948-1949	\$ 1,442.93
Legislative appropriation	90,000.00
Receipts from sales of bulletins, etc.	5,344.88
TOTAL	\$96,787.81

Disbursements and Commitments:

Salaries and miscellaneous labor	\$44,125.98
Travel and per diem	3,048.41
Office supplies	1,451.00
Printing and publications	3,946.38
Publicity	632.05
Rental and services	4,000.00
Library	735.10
Rental, etc. (Artesia office)	812.36
Laboratory and scientific supplies	15,802.40
Repairs autos, trucks, etc.	2,234.00
Purchases, equipment	1,533.57
Resale supplies	1,312.58
Miscellaneous (postage, telephone, audit, insurance, etc.)	2,628.82
Purchases, autos and trucks	3,482.03
TOTAL	\$85,744.68
Outstanding obligations from	
Fiscal Year, 1949-1950	9,043.13
Carry-over from Fiscal Year, 1949-1950	2,000.00
TOTAL	\$96,787.81

BASIC GEOLOGY AND GROUND WATER SURVEYS

Receipts:

Carry-over from Fiscal Year, 1948-1949	\$ 5,011.03
Legislative appropriation	20,000.00
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TOTAL	\$25,011.03

Disbursements and Commitments:

Salaries and miscellaneous labor	\$16,599.09
Travel and per diem	1,335.55
Supplies and equipment	28.45
Repairs autos, trucks, etc.	95.79
Miscellaneous (telephone, telegraph, postage, freight, etc.)	592.00
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TOTAL	\$18,650.88

Outstanding obligations from

Fiscal Year, 1949-1950	1,000.00
Carry-over from Fiscal Year, 1949-1950	5,360.15
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TOTAL	\$25,011.03

BUDGETS FOR FISCAL YEAR 1950-1951

STATE BUREAU OF MINES—GENERAL

Receipts:

Carry-over from Fiscal Year, 1949-1950	\$ 2,000.00
Actual legislative appropriation	90,000.00
Estimated from sales of bulletins, assays, etc. ...	6,200.00
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TOTAL	\$98,200.00

Proposed Disbursements:

Salaries and miscellaneous labor	\$63,000.00
Travel and per diem	7,000.00
Office supplies	1,500.00
Printing and publications	6,950.00
Publicity	500.00
Rental and services	4,000.00
Library	700.00
Rental, etc. (Artesia office)	800.00
Laboratory and scientific supplies	4,000.00
Repairs autos, trucks, etc.	2,000.00
Repairs furniture, fixtures, equipment	500.00
Resale supplies	1,500.00
Fund for purchasing manuscripts	1,200.00
State retirement	1,000.00
Miscellaneous (telephone, telegraph, postage, insurance, freight, express, audit, etc.)	1,550.00
Purchases autos, trucks	2,000.00
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TOTAL	\$98,200.00

BASIC GEOLOGY AND GROUND WATER SURVEYS

Receipts:

Carry-over from Fiscal Year, 1949-1950	\$ 5,360.15
Actual legislative appropriation	20,000.00
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TOTAL	\$25,360.15

Proposed Disbursements:

Salaries and miscellaneous labor	\$14,700.00
Travel and per diem	1,800.00
Supplies and equipment	275.00
Printing and publications	7,000.00
Repairs autos, trucks, etc.	200.00
Miscellaneous (telephone, telegraph, postage, freight, etc.)	592.00
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TOTAL	\$24,567.00
Estimated carry-over from	
Fiscal Year, 1950-1951	793.15
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TOTAL	\$25,360.15

The Mineral Industry of New Mexico

DURING THE YEAR ending June 30, 1950, the mineral industry of New Mexico, the prime industry of the State, yielded products having a value of \$189,740,849, distributed as follows:

FUELS

	<i>Quantity</i>	<i>Value</i>
Crude oil ¹	46,473,857 bbls.	\$113,860,949
Natural gas ¹	202,252,182 MCF	10,112,609
Natural gasoline and allied products ²	4,451,595 bbls.	11,796,726
Coal ³	772,172 tons	3,775,405
TOTAL		\$139,545,689

METALS³

	<i>Quantity</i>	<i>Value</i>
Copper	55,683 tons	\$ 20,428,114
Siliceous copper ore	13,606 tons	40,035
Gold	2,279 oz.	77,838
Iron-manganese ore	55,000 tons	220,000
Lead	1,017 tons	190,967
Manganese concentrate ..	900 tons	27,000
Molybdenum concentrate	511 tons	448,568
Silver	132,326 oz.	115,172
Vanadium—in uranium ore	2,594 tons	61,273
Zinc	12,680 tons	2,717,974
TOTAL		\$24,326,941

¹New Mexico Oil Conservation Commission

²U. S. Bureau of Mines

³New Mexico State Inspector of Mines

NONMETALS³

	<i>Quantity</i>	<i>Value</i>
Barite concentrate	300 tons	\$3,000
Beryl	100 tons	30,000
Brick and tile	21,927 tons	194,984
Drilling mud	656 tons	2,624
Fire clay	2,025 tons	5,818
Pit-run clay	10,000 tons	3,000
Fluorspar concentrate ...	18,939 tons	322,162
Pit-run gravel	53,920 yds.	54,315
Screened gravel	328,381 yds.	403,292
Pit-run sand	3,266 yds.	4,105
Screened sand	294,125 yds.	352,389
Lepidolite ore	415 tons	4,146
Mica concentrate	20 tons	500
Perlite	17,244 tons	74,836
Potash ore	4,759,369 tons	23,787,475
Pumice	148,924 tons	428,054
Salt	25,260 tons	50,632
Scoria	301,748 tons	145,558
Spodumene ore	95 tons	1,329
TOTAL		\$25,868,219

Though petroleum and natural gas account for the lion's share of the value of mineral output, New Mexico is a leading producer of copper and zinc and is the main source of potash in the Western Hemisphere. Because of the relatively depressed state of metal mines and some lack of demand, the production of base metals was much smaller than in previous years. The spectacular rise in metal prices did not come sufficiently early to be reflected in the statistics for the Fiscal Year 1949-1950. Potash output was adversely affected by a 73-day strike. During Fiscal Year 1950-1951 it is expected that the amount, and particularly the value, of mineral commodities will show a marked increase. The incidence of a war economy stimulates mineral industry activity greatly.

³New Mexico State Inspector of Mines

Bureau Personnel

Eugene Callaghan (Appointed September 1, 1949)	Director	1
E. C. Anderson (Appointed September 1, 1949)	Mining Engineer	
Donn M. Clippinger	Materials Engineer	3
Philip F. McKinlay	Economic Geologist	
Robert H. Weber (Employed May 15, 1950)	Economic Geologist	
Richard C. Northup (Resigned Feb. 13, 1950)	Petroleum Geologist	3
Robert A. Bieberman (Employed June 1, 1950)	Petroleum Geologist	
Edward E. Kinney	Petroleum Engineer	
Richard A. Matuszeski	Chemist and Assayer	1
Mrs. Marian R. Burks	Office Manager	
Mrs. Betty D. Diddle	Stenographer	4
Mrs. Ruth A. Miller (Resigned May 15, 1950)	Stenographer	
Mrs. Jean K. Burand (Employed June 5, 1950)	Stenographer	
Mrs. Dollie Newton	Stenographer	
Howard K. Lucas	Museum Curator	

ON LOAN FROM U. S. GEOLOGICAL SURVEY

Gerth E. Hendrickson	Geologist, Ground Water Survey
Ralph E. Smith	Geologist, Ground Water Survey
Zane E. Spiegel	Geologist, Ground Water Survey

PART-TIME STUDENT ASSISTANTS

Alan N. Cheetham, New Mexico School of Mines
 James W. Coombe, New Mexico School of Mines
 Modesto del Castillo, New Mexico School of Mines
 Frank Fleishman, New Mexico School of Mines
 Jack Hunt, New Mexico School of Mines
 William J. Linton, New Mexico School of Mines
 Kenneth Reim, New Mexico School of Mines
 John H. Schilling, State College, Pennsylvania
 William D. Tipton, New Mexico School of Mines
 Lewis Wheeler, New Mexico School of Mines

GEOLOGISTS ON SPECIAL PROJECTS

John E. Allen, College Division, New Mexico School of Mines
 William L. Basham, Northwestern University
 Richard H. Jahns, California Institute of Technology
 Stewart E. Jones, College Division, New Mexico School of Mines
 Lloyd C. Pray, California Institute of Technology
 John T. Stark, Northwestern University
 John F. Waldron, Stanford University

STUDENT ASSISTANCE FELLOWSHIPS

Donald W. Boyd, Columbia University
 Wolfgang E. Elston, Columbia University
 Henry L. Jicha, Jr., Columbia University
 Frederick J. Kuellmer, University of Chicago
 David Llewellyn, Stanford University

Publications

(Revised January 1, 1951)

PUBLICATIONS OF THE MINERAL RESOURCES SURVEY

No.	Title and Author	Date	Price
1	The Mineral Resources of New Mexico; Fayette A. Jones -----	1915	Out of print
2	Manganese in New Mexico; E. H. Wells -----	1918	Out of print
3	Oil and Gas Possibilities of the Puertecito District, Socorro and Valencia Counties, New Mexico; E. H. Wells -----	1919	Out of print

PUBLICATIONS OF THE NEW MEXICO BUREAU OF MINES AND MINERAL RESOURCES

BULLETINS

4	Fluorspar in New Mexico; W. D. Johnston, Jr. (Superseded by Bulletin 21) -----	1928	Out of print
5	Geologic Literature of New Mexico; T. P. Wootton (Superseded by Bulletin 22) -----	1930	Out of print
6	Mining and Mineral Laws of New Mexico; Charles H. Fowler (Superseded by Bulletin 16) -----	1930	Out of print
7	The Metal Resources of New Mexico and their Economic Features; S. G. Lasky and T. P. Wootton -----	1933	Out of print
8	The Ore Deposits of Socorro County, New Mexico; S. G. Lasky -----	1932	.60
9	The Oil and Gas Resources of New Mexico; Dean E. Winchester (First edition; superseded by Bulletin 18) -----	1933	Out of print
10	The Geology and Ore Deposits of Sierra County, New Mexico; G. Townsend Harley -----	1934	Out of print
11	The Geology of the Organ Mountains, with an Account of Dona Ana County, New Mexico; Kingsley Charles Dunham -----	1935	Out of print
12	The Non-Metallic Mineral Resources of New Mexico and their Economic Features (Exclusive of Fuels); S. B. Talmage and T. P. Wootton -----	1936	.50
13	Geology and Economic Features of the Pegmatites of Taos and Rio Arriba Counties, New Mexico; Evan Just -----	1937	.50
14	Some New Mexico Fusulinidae; C. E. Needham -----	1937	.50
15	The Geology and Ore Deposits of Northeastern New Mexico (Exclusive of Colfax County); G. Townsend Harley -----	1940	.60
16	Mining, Oil, and Mineral Laws of New Mexico; C. H. Fowler and S. B. Talmage (Supersedes Bulletin 6) -----	1941	.75
17	Pennsylvanian System in New Mexico; M. L. Thompson -----	1942	.50
18	The Oil and Gas Resources of New Mexico; compiled by Robert L. Bates (Second edition; supersedes Bulletin 9) -----	1942	2.50
19	Manganiferous Iron-ore Deposits near Silver City, New Mexico; Lawson P. Entwistle -----	1944	.50

20	Stratigraphy of the Colorado Group, Upper Cretaceous, in Northern New Mexico; Charles H. Rankin -----	1944	Out of print
21	Fluorspar Resources of New Mexico; H. E. Rothrock, C. H. Johnson, and A. D. Hahn (Supersedes Bulletin 4) -----	1946	2.50
22	Geologic Literature of New Mexico Through 1944; Robert L. Bates and Marian R. Burks (Supersedes Bulletin 5) -----	1945	Out of print
23	Stratigraphy and Oil-producing Zones of the Pre-San Andres Formations of Southeastern New Mexico—A Preliminary Report; Robert E. King -----	1945	Out of print
24	Building Blocks from Natural Lightweight Materials of New Mexico; Donn M. Clippinger -----	1946	.50
25	Mica Deposits of the Petaca District, Rio Arriba County, New Mexico, with Brief Descriptions of the Ojo Caliente District, Rio Arriba County, and the Elk Mountain District, San Miguel County; Richard H. Jahns -----	1946	2.00
26	Geology of the Gran Quivira Quadrangle, New Mexico; Robert L. Bates, Ralph H. Wilpolt, Archie J. MacAlpin, and Georges Vorbe -----	1947	.60
27	Contributions of New Mexico's Mineral Industry to World War II; compiled by T. D. Benjovsky -----	1947	.50
28	Pumice Aggregate in New Mexico—Its Uses and Potentialities; Donn M. Clippinger and Walter E. Gay -----	1947	Out of print
29	Pre-San Andres Stratigraphy and Oil-producing zones in Southeastern New Mexico—A Progress Report; E. Russell Lloyd -----	1949	2.00
GROUND-WATER REPORT			
*1	Geology and Ground-Water Resources of the Eastern Part of Colfax County, New Mexico; Roy L. Griggs -----	1948	3.00
OIL AND GAS REPORTS			
4-A	New Mexico Oil and Gas Statistical Data for 1948; compiled by E. E. Kinney, Lea County Operators Committee, and New Mexico Oil Conservation Commission -----	1949	2.25
4-B	New Mexico Oil and Gas Engineering Data for 1948; compiled by E. E. Kinney, Lea County Operators Committee, and New Mexico Oil Conservation Commission -----	1949	2.25
4-C	San Juan Basin, New Mexico, Oil and Gas Data Summary Cumulative to January 1, 1949; compiled by E. E. Kinney -----	1949	Out of print
5-A	New Mexico Oil and Gas Statistical Data for 1949; compiled by E. E. Kinney, Lea County Operators Committee, and New Mexico Oil Conservation Commission -----	1950	5.00
5-B	New Mexico Oil and Gas Engineering Data for 1949; compiled by E. E. Kinney, Lea County Operators Committee, and New Mexico Oil Conservation Commission -----	1950	5.00

* Prepared in cooperation with the U. S. Geological Survey and the State Engineer of New Mexico.

CIRCULARS

1	An Outline of the Mineral Resources of New Mexico; E. H. Wells -----	1930	Out of print
2	Geology and Ore Deposits of the Ground Hog Mine, Central District, Grant County, New Mexico; S. G. Lasky -----	1930	Out of print
3	First, Second, and Third Annual Reports of the Director, and Preliminary Report for the Fourth Year; E. H. Wells -----	1931	Out of print
4	The Hobbs Field and Other Oil and Gas Areas, Lea County, New Mexico; Dean E. Winchester	1931	Out of print
5	Gold Mining and Gold Deposits in New Mexico; E. H. Wells and T. P. Wootton, 1932; revised by T. P. Wootton -----	1940	Out of print
6	Carbon Dioxide in New Mexico; E. H. Wells and A. Andreas (Superseded by Circular 9)-----	1938	Out of print
7	Outlook for Further Ore Discoveries in the Little Hatchet Mountains, New Mexico; S. G. Lasky -----	1940	Out of print
8	Selected Bibliography on Coal in New Mexico; Robert L. Bates -----	1943	No charge
9	Carbon Dioxide in New Mexico; Sterling B. Talmage and A. Andreas (Reprinted from Bulletin 18) -----	1942	No charge
10	Natural Light-weight Building-block Materials of New Mexico; T. D. Benjovsky and D. M. Clippinger -----	1945	Out of print
11	Reconnaissance Survey of the Headstone Mining District, Rio Arriba County, New Mexico; T. D. Benjovsky -----	1945	No charge
12	Future Oil Possibilities of New Mexico; Robert L. Bates -----	1946	Out of print
13	Compilation of State Tax Law Relating to Mineral Properties in New Mexico; E. P. Ripley	1946	Out of print
14	Oil and Gas Production Data, Eddy County, New Mexico, 1943-1945; compiled by N. Raymond Lamb and W. B. Macey -----	1947	Out of print
15	Tables of Fluorescent and Radioactive Minerals; compiled by Robert L. Hershey -----	1947	No charge
16	New Mexico Oil and Gas Production Data for 1946 (Exclusive of Lea County); compiled by N. Raymond Lamb and W. B. Macey -----	1947	Out of print
17	Caprock Pool Statistical Report, Chaves and Lea Counties, New Mexico; compiled by N. Raymond Lamb and William B. Macey -----	1947	Out of print
18	Geology and Ore Deposits of Red River and Twining Districts, Taos County, New Mexico —A Preliminary Report; Charles F. Park, Jr. and Philip F. McKinlay -----	1948	Out of print
19-A	New Mexico Oil and Gas Statistical Data for 1947; compiled by N. Raymond Lamb and Lea County Operators Committee -----	1948	No charge
19-B	New Mexico Oil and Gas Engineering Data for 1947; compiled by N. Raymond Lamb and Lea County Operators Committee -----	1948	No charge
20	New Mexico Oil and Gas Summary Data for 1948; compiled by Lea County Operators Committee -----	1949	Out of print
21	Barite of New Mexico; compiled by Donn M. Clippinger -----	1949	No charge

26 STATE BUREAU OF MINES AND MINERAL RESOURCES

22	Index to Samples from Oil and Gas Well Tests in Library at Socorro, New Mexico; compiled by Robert A. Bieberman and Betty Diddle ----	1950	No charge
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ANNUAL REPORTS

1	For the Fiscal Year July 1, 1945-June 30, 1946; E. C. Anderson -----	1946	Out of print
2	For the Fiscal Year July 1, 1946-June 30, 1947 (includes Annual Report of State Inspector of Mines); E. C. Anderson -----	1947	Out of print
3	For the Fiscal Year July 1, 1947-June 30, 1948 (includes Annual Report of State Inspector of Mines); E. C. Anderson -----	1948	Out of print
4	For the Fiscal Year July 1, 1948-June 30, 1949 (includes Annual Report of State Inspector of Mines); E. C. Anderson -----	1949	No charge

OIL AND GAS MAP

Oil and Gas Map of New Mexico; revised and enlarged to Jan. 1, 1949, by Richard C. Northup and Donald D. Forrey. Scale about 10½ miles to 1 inch -----	1949	1.50 (paper) 2.00 (cloth)
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WELL LOGS

Over 6,000 typed drillers' logs of wells drilled in New Mexico -----	Prices on request
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PUBLICATIONS OF THE U.S. GEOLOGICAL SURVEY, IN COOPERATION WITH THE NEW MEXICO BUREAU OF MINES AND MINERAL RESOURCES

870	Geology and Ore Deposits of the Bayard Area, Central Mining District, New Mexico; Samuel G. Lasky -----	1936	Out of print
885	Geology and Ore Deposits of the Lordsburg Mining District, Hidalgo County, New Mexico; Samuel G. Lasky -----	1938	1.25

PROFESSIONAL PAPERS

200	Geology and Ore Deposits of the Magdalena Mining District, New Mexico; G. F. Loughlin and A. H. Koschmann -----	1942	2.00
208	Geology and Ore Deposits of the Little Hachet Mountains, Hidalgo and Grant Counties, New Mexico; Samuel G. Lasky -----	1947	2.50

MAPS AND CHARTS

Geologic Map and Stratigraphic Sections of Paleozoic Rocks of Joyita Hills, Los Pinos Mountains, and Northern Chupadera Mesa, Valencia, Torrance, and Socorro Counties, New Mexico; R. H. Wilpolt, A. J. MacAlpin, R. L. Bates, and Georges Vorbe. Scale 1 mile to 1 inch. Preliminary Map 61, Oil and Gas Investigations -----	1946	.65
Geology of Northwestern Quay County, New Mexico; Ernest Dobrovolsky, C. H. Summerson, and Robert L. Bates. Preliminary Map 62, Oil and Gas Investigations -----	1946	.75

THE FIELD projects listed below were in progress or completed by the State Bureau of Mines and Mineral Resources during the year. The location of each project is shown by the corresponding number on the map.

1. Costilla and Latir Peak quadrangles.
2. Questa and Eagle Nest quadrangles.
3. Manzano Mountains.
4. Capitan quadrangle.
5. Black Range NW quadrangle.
6. Black Range NE and SE quadrangles.
7. Geologic section of the Black Range.
8. Sherman quadrangle.
9. Lake Valley quadrangle.
10. Sacramento Mountains.
11. El Paso Gap quadrangle.

