

STATE OF WASHINGTON
ARTHUR B. LANGLEIE, GOVERNOR

Department of Conservation and Development
ED DAVIS, Director

FOURTH BIENNIAL REPORT
of the
**DIVISION OF MINES
AND MINING**

For the Period Commencing October 1, 1940
and Ending September 30, 1942

By
SHELDON L. GLOVER, SUPERVISOR



OLYMPIA
STATE PRINTING PLANT
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DIVISION OF MINES AND MINING

SHELDON L. GLOVER
Supervisor

INTRODUCTION

The activities of the Division of Mines and Mining during the period of October 1, 1940, to September 30, 1942, followed the pattern outlined by the Mines and Mining Act, under which the division was established in March, 1935. The functions authorized by this act are set forth in the First Biennial Report of the division, published in 1937 in the Eighth Biennial Report of the Department of Conservation and Development (for the period of October 1, 1934, to September 30, 1936). Briefly, they are to acquire all possible information on the occurrence and development of the state's mineral resources, to disseminate that information, and to aid in all ways in the proper understanding and efficient development and utilization of these resources.

PERSONNEL

Several changes in the personnel of the staff took place during the past biennium. Thomas B. Hill, supervisor of the division since its establishment, left on November 1, 1941, to take charge of other activities of the Department of Conservation and Development. He was succeeded by Sheldon L. Glover, who was formerly assistant supervisor of the Division of Geology and since September 18, 1941, had been associated with the Division of Mines and Mining. Ward Carithers, formerly with Chelan Division, Howe Sound Mining Co., was engaged as a geologist on February 13, 1942, replacing John W. Melrose, resigned. Stephen H. Green, mining engineer, was employed from May 25, 1942, to September 3, 1942, for work on a special magnesite investigation. Philip H. Holdsworth, mining engineer and geophysist, was engaged September 5, 1942, for special investigations of ore deposits, and Alton K. Guard, geologist and experienced miner, was employed as field assistant.

MINERAL RESOURCE DATA

The assembling of information on the mineral resources of the state continues to be one of the basic activities of the division. It is carried on as rapidly as possible, whenever more urgent investigations permit, and involves a large amount of work in both the office and the field. An immense volume of factual material is scattered through the more than 4,000 reports, articles, and references that deal with Washington geology. This extensive literature, and particularly the 62 publications of the Washington Geological Survey and its successor the State Division of Geology, is being searched for specific references to mineral occurrences, so that the information on any given resource may be put in concise usable form and made easily available when required. Many references that are obtained in this way are but little better than hearsay and rumors; these require field study for proper evaluation. Field investigations are also required by current reports of mineral

discoveries made by prospectors and others. These last are particularly numerous at the present time, when so many persons, commonly with scant knowledge of minerals, are searching for materials that may be of use in the war effort.

INFORMATION ON MINES AND PROSPECTS

It is highly desirable to have accurate information on the status of prospecting and mining. The needed data for a given property include: name, location, ownership, name of operators, size of operation, minerals sought or mined, representative analyses, amount and kind of development, general milling methods (if used), production (if any), and the essentials of the geology of the occurrence. One of the basic endeavors of the division is to acquire this information for every mine and for as many prospects as possible, and to distribute it for the use of the mining industry and all others who may be interested. It requires constant field work and a thorough canvassing of the mining districts. To obtain the desired data by questionnaire is not feasible, though that method may be used to supplement and bring up to date the information obtained by personal visits to the properties. This work was begun as soon as field work was possible in 1942. From then until September 30 some 260 field conferences were held and 74 mines and prospects were examined in more-or-less detail. Greater progress in this work was not possible, due to the fact that special inquiries and investigations pertaining to the war effort were given precedence at all times and continually interrupted scheduled activities.

The examination of mines and prospects has another and equally important purpose. It makes possible a personal acquaintance on the ground with the prospector and small miner, whereby the problems of the operator may be discussed. If desired, the member of the staff will make suggestions, give any possible advice, and aid in obtaining a proper understanding of the geology of the mineral occurrence. Also, in the case of nonproducing meritorious properties, he attempts to discover what is delaying production. This delay may be due to the lack of a road, to the need of adequate financing, to the absence of a mill, to insufficient or ill-advised development, or other causes. Once these difficulties are understood, the division may then be able to suggest a possible relief or recommend steps involving federal or other aid.

Personal acquaintance with those interested in the state's mineral resources, on either the side of production or utilization, is gained also in office conferences. An endless variety of problems, inquiries, and requests are brought to Olympia for attention. In this way, 325 conferences involving mines and minerals were held from January 1 to September 30, 1942. During this same period more than 900 additional inquiries were handled by correspondence. The division makes every effort to supply the information desired, to aid in mineral development, and to ascertain the value of local materials and further their use by industry.

PUBLICATIONS

Much of the information that is on hand and which is constantly being obtained does not lend itself to distribution by means of published reports. It is a composite made up of past experiences, observations, bits of history, and uncatalogued data that forms a necessary background for an understand-

ing of our mineral resources and which is only obtained through long familiarity with the state and its geology. Nevertheless, this is available and is drawn upon in conferences and in answering letters of inquiry. Other data are made the subject of printed or mimeographed reports with as little delay as possible. During the past biennium the following were distributed:

REPORTS OF INVESTIGATIONS

1. Olympic Peninsula manganese, by J. W. Melrose. 1940. 30 pp. (mimeographed.)
2. Washington iron ores, a summary report, by Sheldon L. Glover. 1940. 23 pp. (mimeographed.)
3. Mineral resources of the Wenatchee-Ellensburg-Yakima region, by Sheldon L. Glover. 1942. 13 pp. (mimeographed.)

INFORMATION CIRCULARS

6. Summary of information on iron ore deposits of Washington, by J. W. Melrose. 1940. 11 pp. (mimeographed.)
7. Directory of Washington metallic mining properties, by Thomas B. Hill and J. W. Melrose. 1941. 74 pp. (mimeographed.)

Also, an up-to-date list of publications of the Divisions of Geology and Mines and Mining was printed, and the expense of printing the Division of Geology Report of Investigations No. 6, entitled "Inventory of Mineral Properties in Snohomish County, Washington," was borne by the Division of Mines and Mining so that the public could have the information with the least possible delay.

AID IN THE WAR EFFORT

After December 7, 1941, all usual activities were subordinated to those which would aid in the war effort. The general trend of prospecting and mineral interest gradually shifted to the strategic and critical materials. The division found itself increasingly called upon to explain the new industrial trends and assist in reorienting the objectives of prospectors and miners. The accumulated information that the state had acquired from 50 years of work then became of the utmost importance. The attention of prospectors and operators could be directed to newly valuable mineral deposits and to areas where the geology was known to be favorable for the occurrence of desired materials. Equally important, industry could be directed to local sources of supply not hitherto considered.

The division has been called upon many times since the outbreak of war to supply information to various federal agencies that are interested in mineral development. Compliance with these requests is given precedence over all other activities. At times it has involved correspondence on well-known subjects that required no preliminary study; other inquiries and requests have necessitated considerable research and, on occasion, extended trips and field work. Agencies worked with include the U. S. Geological Survey, U. S. Bureau of Mines, Office of Production Management, War Production Board, and Reconstruction Finance Corporation. All these are offered and given complete cooperation in any investigations in which the personnel or facilities of the division can be of service.

MAGNESITE INVESTIGATION

On April 9, 1942, the State Planning Council approved a project involving the use of a special fund for the diamond drilling of magnesite properties, providing the work should be sponsored by the Department of Conservation

and Development. Accordingly, arrangements were made by the department to undertake a research program on the Turk deposit, located on state land in the south part of Sec. 36, T. 30 N., R. 37 E. This work was under the general supervision of the Division of Mines and Mining, and a member of the staff was continuously employed on the project to attend to the collection and shipment of cores and other samples, compile a log of the drilling, and maintain efficient operation.

The Division of Geology cooperated throughout and was responsible for the location of drill holes, the carrying on of analytical work, and the interpretation of results. The work was begun on April 15, 1942, and was completed about October 15, 1942. Nineteen holes were drilled, totalling 5,261 feet, and a commercial body of magnesite containing more than 2 million tons was proved and thoroughly sampled, showing that ample magnesite was available here to support an industry for the reduction of metallic magnesium.

MINERAL EXHIBIT

An extensive display of commercially important metallic and nonmetallic minerals and aggregates is maintained by the division. Most of these specimens are from state sources and are representative of valuable mineral types that are now being produced or which could be produced; some are from out-of-state sources and represent materials not known to occur in Washington but for which prospectors should be on the alert. The collection of these specimens was begun early in 1942 and now includes some 200 items; new material is constantly being added and the display revised.

The collection is designed to acquaint prospectors with the appearance and other physical characteristics of important minerals with which they may be unfamiliar. It also is used to apprise processors and manufacturers of Washington materials that may be available to augment or supplant out-of-state supplies. The interest shown in the display is sufficient proof that the space allotted it and the time spent in its collection and arrangement are amply justified.

Ore samples.—An additional collection, distinct from the display just mentioned, is gradually being acquired. This is designed to include representative hand specimens of the minerals characteristic of each prospect or mining property in the state. The samples are obtained by members of the staff when they visit the individual properties in order to obtain information on ore occurrence and development. They form an adjunct to the field notes and maps that apply to the property in question and are necessary to a proper understanding of the mineralization. When the samples have served their purpose in the laboratory, they are labeled and filed in a permanent collection for such future needs as may develop.

LABORATORY FACILITIES

The mineralogical laboratory of the division has acquired a considerable amount of essential equipment during the past biennium and has played an increasingly important part in current activities. Its basic purpose is to permit detailed study of minerals, and so supplement the investigations made at mines and prospects. The facilities for mineral identification have been

increased to allow a certain amount of qualitative analytical work. An excellent petrographic microscope was purchased, as well as equipment for preparing thin sections of rocks and ores for petrographic study. Also, additional equipment was procured for the identification of minerals by means of ultra-violet light, and a valuable set of fluorescent minerals has been arranged for comparative purposes.

Plans adopted early in 1942 called for carrying on certain lines of investigation that required still other needed equipment, but the effect of priorities and instrument shortages slowed delivery on most items and effectually prevented the obtaining of some things. As the investigations are, for the most part, directly applicable to the war effort, the situation was greatly relieved by the War Production Board granting, first, an A-2 priority and, later, an A-1-a to the laboratory. It is expected that eventually the additional equipment may be secured to permit even greater use of the various techniques of mineral research.

MINERAL IDENTIFICATION SERVICE

The laboratory facilities are available to the general public, and any one interested may submit samples of minerals and rocks for examination. Assays and quantitative analyses are not made, but samples obtained in the state are identified without charge, possible commercial value is indicated, advice is given on the need for further work (such as chemical analysis or additional prospecting), and, if warranted, the names of commercial users of the material in question are suggested. This service is used and appreciated by miners, prospectors, and others throughout the state. During the past biennium 688 samples were submitted and were examined in the laboratory and reported on to the senders.

MINES-TO-MARKET ROADS

Petitions for 23 mines-to-market roads were submitted to the Mines-to-Market Road Commission in the biennium ending September 30, 1942. These requested construction of 113.75 miles of road to serve various mineralized areas in the state. Six roads had been constructed or were under construction at close of biennium, and surveys had been made on some of the others. With respect to most of the petitions the counties were unable to contribute one-half the cost as required by law, so construction could not proceed.

Following is a record of petitions received and the status of those roads upon which construction was begun:

Chelan County—For a 3-mile extension of the Stehekin road, previously constructed, into the Horseshoe Basin. Under construction.

For a road at Merritt, a distance of one-half mile. Constructed.

Grays Harbor County—For a road about 2½ miles in length up Cook Creek. Under construction.

Okanogan County—For a road on Squaw Creek near Methow, in the Methow Valley, a distance of 2¾ miles. Constructed.

For a road northwest of Monse, to serve certain sodium sulphate lakes, a distance of 4 miles. Construction started but suspended for lack of right of way.

Snohomish County—From Barlow Pass to Monte Cristo, a distance of about 5 miles. (This is modification of a petition previously submitted for a road from Big Four Inn to Monte Cristo.) Constructed.

Chelan County—For a road from the Stehekin River up Park Creek, a distance of 6½ miles.

King County—For a road up the Middle Fork Snoqualmie River for about 10 miles to serve a mineralized area near the summit of the Cascade Mountains.

For a road from River Crossing on the North Fork Snoqualmie River to the camp of Lenox Mining Company, a distance of about 6 miles.

For a road from Miller River up Coney Creek, a distance of about 2 miles.

Lewis County—For a road from near Riffe in a southerly direction to the Green River, a distance of about 12 miles, to serve the St. Helens mining district.

Okanogan County—For a road up North Creek from the Twisp River, for a distance of 2½ miles.

Pierce County—For a road from the forest boundary near Fairfax to Coplay Lake, a distance of about 9 miles.

Skagit County—For a road up Thunder Creek from the Whatcom County line, a distance of 9 miles.

Skagit and Whatcom Counties—For a road about 12 miles in length to serve a chromite area in the Twin Sisters Mountains, in northern Skagit and south central Whatcom counties.

Skamania County—For a road 4 miles in length from the end of the present road on the south side of Spirit Lake, around the east end of the lake. This is in the Spirit Lake mining district.

Snohomish County—For a road from the Sultan River up Williamson Creek, a distance of about 6 miles.

For a road up Martin Creek from the South Fork Stilaguamish River, a distance of about 4 miles.

For a road up the South Fork Stilaguamish River near Big Four Inn, a distance of about 2½ miles.

For a road near Arlington to serve certain limestone deposits, a distance of 1½ miles.

For a road east of Mineral City, a distance of 2 miles.

For a road up Weden Creek, a distance of 1 mile.

Stevens County—For improvement of an existing county road to serve an area where magnesite is being mined.

STATEMENT OF EXPENDITURES

ROADS	COUNTY	Authorization	Expended
Cook Creek	Grays Harbor.....	\$12,855 00	\$3,786 02*
Barlow Pass	Snohomish.....	26,000 00	20,082 51
Horseshoe Basin Extension.....	Chelan.....	13,500 00	5,431 04
Squaw Creek	Okanogan.....	4,697 00	734 06
Monse	Okanogan.....	8,009 10	3,044 62
Merritt	Chelan.....	2,094 96	1,916 62
South Fork Snoqualmie.....	King.....	2,000 00	18 60
Mineral City	Snohomish.....	75 00	18 22
Totals.....		\$69,231 06	\$35,031 69

* Approximately \$10,000.00 had been expended by October 31, 1942.

The mines-to-market road law was enacted by the legislature in 1939, with an appropriation of \$100,000. During the biennium ending September 30, 1940, 15 petitions were received, and 3 roads constructed as follows:

Stehekin road in Chelan County.....	\$24,587.20
Money Creek road in King County.....	58,890.47
Twisp-Lookout Mountain road in Okanogan County.....	9,885.41
Total.....	\$93,363.08

SUMMARY

Appropriated in 1939.....	\$100,000.00
Expended in biennium ending September 30, 1940.....	93,363.08
Balance reappropriated	\$6,636.92
Appropriated in 1941.....	200,000.00
Amount available for biennium ending September 30, 1942....	\$206,636.92
Expending in biennium ending September 30, 1942.....	35,031.69
Unexpended balance in fund.....	\$171,605.23