State Department of Geology and Mineral Industries

1069 State Office Building
Portland 1, Oregon

MINING IN BAKER COUNTY

Mining operations in Baker County were more numerous and more diversified during the first sixty years of the county's history (1860 to 1920) than is commonly recognized today. For example, tuff was quarried and shaped into dimension stone over a period of several years at quarry sites located at Pleasant Valley and in the vicinity of Baker City. Limestone was mined and burned for an even longer period of time in at least a half dozen batch kilns located at various places in the county. Bricks were made for awhile from clay produced from a pit in Baker and another near Sumpter. The important gypsum deposits on the ridge above the Snake River below Huntington were mined to the point of being depleted during the opening decades of the present century and the Northwest Granite company at Haines, originally established in 1890 was a small, but soundly entrenched producer of cut and polished cemetary markers that operated from its own quarry until as recently as 1960. In short, the downtown business districts in most communities and many of the important public buildings and schools, etc., in the county, and in part, even homes, were built of brick and stone and mortar and plaster produced substantially by thriving local industry.

To this must be added intensive, though generally unproductive efforts spent on the investigation of what were then regarded as hopefully important prospects of other minerals. A partial list includes exploration work done on copper prospects in the vicinity of Homestead and elsewhere around the turn of the century and attempts to produce manganese, tungsten, antimony and even chrome ores during the industrial emergency occasioned by World War I.

During all this period, however, gold and silver mining is what commanded the most attention and generated the most noteriety. Operations were active on both lode and placer mines at one place or another at all times, although a tapering-off in the tempo of activity became apparent towards the end of the period as the placers and the near surface lode occurrences were depleted and most of the old milling facilities became obsolescent. Considered overall, this period was characterized by a higher level of interest in mineral resources and mineral resource development on the part of the average citizen, with a far greater percent of the populace directly and indirectly concerned with mining, than has been the case since.

Between 1920 and now, some significant changes took place. Dimension stone as a building material lost popularity and the quarries shut down. With improved transportation facilities it became possible to import better quality bricks from outside sources. However, it also became possible to export. Thus the quarrying of limestone went big-time with the installation in the twenties of the cement plant at Lime — an operation that has maintained continuous and expanding activities ever since, supplying limestone for their kiln at Lime and for another company-owned cement facility at Lake Oswego and also, much of the time, for the sugar refinery at Nyssa. In addition, with the availability of natural gas in the area, and because of a newly developed demand for high purity burned lime for the manufacture of carbide and increasing demands by the paper industry in the northwest, the Chemical Lime Company began operation at Wingville in 19 . Incidentally, as is inevitable with all mineral resource operations, both companies exhausted their original sources of limestone and were forced to open new quarries. The ability to export has sparked a revival of interest in stone for building purposes also, although now the demand is for decorative

material rather than for structural dimension stone. Thus Dooley Mountain rhyolite breccia has been shipped to distant points in considerable quantities during recent years.

With respect to the exploration and development of the fringe minerals since 1920, it can be said that a sizable amount of copper was produced from the Iron Dike property at Homestead during the twenties and earnest, but unsuccessful efforts were made to establish operations on the copper showings in the Mother Lode area near Keating during the late twenties and early thirties. Also, and for the second time, the shortages of critically important minerals attending World War II and the Korean emergency resulted in temporary re-activation of the antimony and manganese properties. In addition, exploration work was done on the diatomite occurrences near Keating in sufficient amounts to demonstrate they are extensive enough to be mineable if, and when, marketing conditions offer the opportunity to establish an operation. A similar situation exists in the instance of a newly opened talc prospect on Dooley Mountain. Likewise, the perlite occurrences on Dooley Mountain have been tested for expansibility by several different interested parties during the past twenty years and found to have good commercial properties. In fact, truck load lots have been tested at a plant in Portland during each of the past two years and a tentative contract has been let for commercial delivery beginning next year.

Gold and silver mining subsequent to 1920, and up until operations were closed down by legal edict at the beginning of World War II, carried on with fewer operations than previously, but they were bigger and better organized and more thoroughly mechanized. For example, the Rainbow Lode in the Morman Basin was the biggest single producing lode mine in the state for several years during the late twenties. Cornucopia took over the lead during the thirties, maintaining a payroll of around 250 employees

much of the time until its closure just prior to the War. A substantial tonnage of silver ore was shipped from the Bay Horse mine near Huntington and a high level of mechanization prevailed at most placer operations with bucketline dredge installations on Clarks Creek and at Sumpter and several doodle-bug type washing plants active from time to time elsewhere.

Then, beginning with World War II, there was the close-down order which brought all operations to a stand still. Ever since, gold and silver mining has been virtually non-existent except for one of the Sumpter dredges which was maintained intact during the war and reactivated for a period of several years afterwards. This failure to resume operation of gold and silver mines after the war is nationwide in scope and not novel to Baker county or eastern Oregon. It is due solely to an adverse economic situation resulting from the fact that by Congressional edict the price of gold is today the same as it was in 1935 —— just as, by the same token, there would be no cattle and logging industries in the county if the prices for cattle and timber were held by law at the same levels that prevailed in 1935.

Abbreviated though it is, this outline of mining history in the county points up trends from which certain generalizations can be made concerning future developments. One such generalization is that just as the expansion of transportation and marketing situations enabled the county's limestone industry to grow, in the space of a few decades, from a half dozen little batch-fed kilns serving a local construction market to a major industry presently suppying raw materials to other manufacturing industries throughout the northwest at large, so also is the current industrial growth in the northwest generating demands for an ever greater and more diversified variety of mineral products. The impact has already been great with respect to mining in the northwest and it can be expected to grow. Accordingly, mining activity in the county can be expected to expand and diversify in

the long run, also. For example, the already established limestone industry can be expected to continue active for years to come even though the newly inaugurated practice of barging raw limestone from British Columbia sources to Portland by sea may put a crimp in local operations from time to time. Furthermore, a potential already exists for an increase in the production of building stone over and beyond that now being made. More significantly, markets can be expected to develop eventually for the perlite and even, in the long run, for the local diatomite and talc. In addition, investigations currently underway indicate that certain rock occurrences in the county may have good pozzolanic properties, hence these too can be regarded as possible candidates for eventual development.

A second generalization can be made with respect to metal mining and in this connection it should be evident that it is the county's now dormant gold and silver properties that rate as its principle metalliferous assets. The generalization here is that our national monetary situation and the increase in world-wide demand for silver for industrial purposes can be expected to force changes with respect to the artificial and arbitrary controls by which the production of these metals is presently governed. After all, it is an admitted fact that our Treasury stocks of both metals are virtually exhausted, yet gold still rates as an essential commodity in international monetary transactions and our silver shortage is even now so acute that the Treasury has been forced to start issuing coins made from substitute metals. In fact, the industrial uses for silver have multiplies so extensively during recent years that the world-wide production of new silver is no longer equal to the industrial demands; hence the Treasury's calling in of silver coins can not amount to more than a stop-gap tactic in their fight to maintain the arbitrary and artificial price structure they are attempting to maintain. Thus, eventual revitalization of gold and silver mining in both the nation and the county seems inevitable.

What these trends indicate with respect to future demands by the mining industry for water in the county can be appraised as follows. First, all processes for converting limestone into industrially marketable forms entail drying, burning and calcining. Water use at the existent operations is nominal and limited mostly to laboratory, shop, sanitary, personnel and emergency fire-fighting needs. Continued operation can be anticipated to require no great excesses. With respect to perlite, processing consists of expansion at high temperatures. However, the economics of marketing is such that this would be done in plants located in the market areas and that crushing and dry screening is all that would take place at the mine site; hence water requirements would be negligible.

Production of sawed dimensions stone would entail some use of water if market demands ever arise to warrant such an operation, However, the production of building stone in the un-sawed, rubble form now required by the construction trade involves no use of water except in purely incidental amounts. Even a major expansion of this production would thus create no forseeably significant demands. With respect to the possibility that market conditions might someday materialize to warrant the establishment of an operation on the diatomite,water requirements would parallel those prevailing at the lime plants because the processing techniques are similar, that is, drying and calcining. Finally, the talc available in the county is a type that will be marketable for only commonplace industrial uses such as fillers and as an insecticide carrier, etc.; hence for any operation that might eventually materialize, the foreseeable practice would be to ship the quarry product in lump form to custom grinding plants in the market areas. Water requirements at any such quarry would be negligible, accordingly.

Metal mining is what is left and this is the most difficult to analyse. Water would be required for washing and milling operations but the amount that might be needed, and the places where the need might occur, are virtually impossible to predict. The reason is that before any washing or milling operations can be started, a vast amount of costly exploration work will have to be done in order to determine which properties have sufficient potential to be minable, and on what scale. How much of such work might take place will depend in turn on the nature of the incentive that may develop for undertaking to re-activate the mines and the extent to which it counter balances the tremendous expenses that would be incurred in re-opening caved and flooded workings and re-equipping properties with mining and milling facilities. In short, there are too many variables to warrant making even a rough estimate of the activity that might prevail if the prices of gold and silver are ever raised or subsidies are ever offered to offset the increases in mining costs that have taken place since the war.

One point that can be made at this time is that even if a favorable incentive for re-activating the mines does materialize, the question of water requirements will not arise until the exploration phase of any re-activation program has been completed and determinations have been made concerning the size, kind and number of milling installations that will be needed. Even then there will be questions concerning the impact this will have on county water-use plans and these questions in turn will still be unanswerable until determinations have been made regarding the amount of water actually needed at each installation and the amount of water that will be returned to the creeks in clarified form after usage. After all, enough new water may be generated by the mine workings to provide part, if not all, of the needed water in some instances. Then too, it will be possible to settle and clarify the tailings and return the bulk of the used water to the drainage systems in most instances. In short, no final appraisal of water needs for this type of mining can be made until all the factors effecting the situation

are fully understood.

By way of summation, the picture is that there are several industrial, nonmetallic mineral situations in the county which can conceivably become minable in the future as demands for such mineral products expand in the west and as competitive occurrences located elsewhere become mined out and the needs materialize for developing new sources of supply. In addition, there are the metal mines which have in the past been productive and which in at least some instances may have capacity for reactivation. Both types of mining rate as industrial assets which in the long run can be important to the economy of the county; hence they are deserving of consideration in any planning dealing with future allocation of water resources. In this connection, however, the water requirements for the two types of mining can be appraised today in only a general way. This is that the forseeable water requirements are not likely to prove great in the instance of the nonmetallic mineral resources deemed most likely to prove minable in the future because water does not play a dominant role in the processing that can be anticipated for these minerals. Conversely, however, water will be vitally essential in connection with most of the washing and/or milling operations that can be anticipated to accompany re-activation of metal mining. No estimate can be made at this time, though, concerning the amount of water that might be needed. There are simply too many unpredictable factors to justify even a guess.

****

W.S. Wagner
December, 1965

State Department of Geology and Mineral Industries

1069 State Office Building
Portland 1, Oregon

A BRIEF SUMMARY OF THE GEOLOGY OF BAKER COUNTY

Baker County lies within the Blue Mountains physiographic province, a region characterized by high mountain ranges and steep walled canyons interrupted in places by broad fertile valleys. Elevations range from less than 2000 feet on Snake River to over 9100 feet in the Elkhorn range. The main drainage systems of the county are the Powder River in the northern part and Burnt River in the southern part. Both flow eastward to the Snake River.

The rocks of the county fall into two major groups. The older is a series of marine sediments and volcanics of Paleozoic and Mesozoic Age that have been intricately folded and faulted and invaded by granite and other types of intrusive rocks. The younger is comprised of a wide variety of lavas, tuffs, and loosely consolidated fresh water sediments and gravels of Tertiary and Quaternary Age. Wherever the contact is exposed the Tertiary and younger rocks are generally seen to lie with angular discordance on the pre-Tertiary rocks and due to the markedly higher degree of deformation and alteration suffered by the pre-Tertiary rocks, the distinction between rocks of the older and younger series is usually quite readily apparent.

Several million dollars worth of gold and silver and some copper have been produced from sources within the county and occurrences of other metallic minerals carrying molybdenum, antimony, manganese, iron and tungsten are known. Excepting for gold placers in Tertiary to recent alluvium these prospects all occur in the older group of rocks. Production of limestone for cement manufacture, sugar refining, paper processing and carbide rates as the principal mineral industry active today because the fixed price of gold in relation to current operating costs no longer affords a favorable economic climate for gold mining. The limestones are one of the pre-Tertiary sediments but deposits of another important non-metal, diatomite, are present at places in association with the Tertiary sediments. Occurrences of the volcanic glass, perlite, are also known in the Tertiary rocks. Both the diatomite and perlite have a growing number of industrial uses and hence constitute reserves for eventual industrial development.

Report by: Brooks & Wagner
February 8, 1963

BAKER COUNTY

BAKER AREA

The Baker area extends west from the town of that name to the crest of the Elkhorn range, and south to the crest of the Dooley Mountain divide. It is bounded on the west by the 118° meridian where it crosses Powder River near Hershal, as well as north of Goodrich Creek to the county line west of North Powder. The area includes all the easterly drainage into Baker Valley and extends north to the big bend in Powder River east of North Powder.

The Baker area includes the districts formerly known as Baker, Pocohontas, Sumpterville, Auburn, Sutton Creek, and California Gulch, now all included under the term Baker district. The Haines district includes the Baker are north of Haingville. Minor subdivisions can now be named accordingly to their respective drainage basins.

CABLE COVE AREA AND DISTRICT

The small Cable Cove district includes the headwaters of Silver Creek 10 miles north of Sumpter as far south as the 44° 50' parallel. It also extends for about a mile north across the divide into Grant County.

CORNUCOPIA AREA

The Cornucopia area includes the entire drainage of Pine Creek and its tributaries, west of the 117° meridian ~~line~~, a line running north from Robinette. The Cornucopia district only includes the drainage of Pine Creek north of the town of Carson.

CONNOR CREEK AREA

The Connor Creek area includes the drainage into the Snake River in Oregon, between the mouth of Burnt River at Huntington and the mouth of the Powder River at Robinette. The Connor Creek district includes the drainage of the

creek of that name.

CRACKER CREEK AREA

The Cracker Creek area includes all the drainage of the Powder River tributaries (McCully and Cracker Creeks) lying north of an east-west line crossing about three miles north of Sumpter, with the exception of the headwaters of Silver Creek, which lie in the Cable Cove district.

The Bourne district includes the drainage of Cracker Creek north of the forks with Fruit Creek, and the McCully district includes that portion of the area lying within R. 35 E.

EAGLE CREEK AREA

The Eagle Creek area includes the entire drainage on the north side of Powder River, from Robinette at its mouth to the county line west of Big Creek, with the exception of the small area of the Sparta district, extending from Eagle Creek on the east to the north-south line between R. 43 and 44 E. on the west.

The Eagle Creek district includes the drainage of Eagle Creek north of Sparta, and the Richland district includes the drainage south of Sparta and north and east of Eagle Creek and the Powder River. It extends for a few miles into Union County.

The Keating district (sometimes called Mother Lode) includes the Powder River drainage in the area west of Sparta and embraces the old ill-defined Sanger district.

(2) copy V

GREENHORN AREA

The Greenhorn area includes those districts known as Greenhorn, New El Dorado, Robinsonville, Bonanza, and Austin. In Baker County it includes the drainage of Upper Burnt River and its tributaries northwest of China Creek, about 10 miles north of Unity. In Grant County it includes the drainage of

the Middle Fork of the John Day River north of the John Day Highway and east of Big Boulder, [redacted] and Sunshine Creeks. It also includes on the north all of the Clear Creek drainage, and most of the drainage basin of Otter and Bear Creeks. and all of the Lightening Creek, ~~drainage south of its junction with Clear Creek~~.

All mines in the area within a mile of the crest of the divides between the John Day and its Middle Fork and the North Fork of Burnt River may be included in the Greenhorn District proper. The drainage of the Middle Fork of the John Day within the area has been called the El Dorado district. In Baker County the Geiser or Bonanza district includes the drainage of Geiser Creek, and the Whitney district includes all the area south and west of the Bonanza.

HOMESTEAD AREA

The Homestead area includes that territory in Baker County bounded by the Snake River on the east and the 117° meridian on the west. The Homestead district proper includes the Snake River drainage from the mouth of Pine Creek north.

LOWER BURNT RIVER

The Lower Burnt River area includes the entire drainage of that stream up to Deer and Cave Creeks, with the exception of Dixie Creek west of R. 44 E.

It includes the Pleasant Valley district (west of Durkee), the Gold Hill district (southeast of Durkee and west of Weatherby), the Chicken Creek district (northeast of Weatherby), and the Huntington district (that portion of Baker County in the area south of Dixie Creek).

MORMON BASIN AREA

The Mormon Basin area within Baker County includes all the drainage of Dixie Creek and its tributaries west of R. 44 E.; and in Malheur County it includes the entire drainage of Willow Creek as far south as Brogan.

The Mormon Basin is a high basin partly draining to the east into Dixie

Creek. The district, however, includes the drainage of the south fork of Dixie Creek and extends into Malheur County for about 2 miles. The Rye Valley district includes all the drainage of the north fork of Dixie Creek.

ROCK CREEK AREA

The Rock Creek area includes the drainage of Powder River tributaries west of the 118° meridian, south of Anthony Creek (the county line) and north of Goodrich Creek.

It includes the districts of Rock Creek and Pine Creek (limited by the drainages of those streams), and the old Elkhorn district, which now falls partly into the Pine Creek district.

SPARTA AREA

The Sparta area includes that territory bounded on the east by Eagle Creek and on the west by the line between R. 43 and 44 E. It has also been extended to the south to include all the drainage south of the Powder River, east of Glasgow Butte and Fivemile Creek.

The Sparta district is restricted to the northern projection of that area draining into Eagle Creek north of Town Gulch. The drainage south of the Powder River can be called the Sheep Mountain district, and that to the north, the Maiden Creek district.

SUMPTER AREA

The Sumpter area includes the drainage of Powder River west of the 188° meridian near Nershal, and south of an east-west line about 3 miles north of Sumpter.

UPPER BURNT RIVER AREA

The Upper Burnt River area includes all the drainage of Burnt River within Baker County from below Cave and Deer Creeks on the east, to China Creek, about 10 miles north of Unity. It also includes the southwesternmost small triangular

portion of Baker County lying in the drainage of Malheur River.

The Bull Run or Unity district lies south of Burnt River and west of Hereford. The Hereford district lies northof Burnt River and west of Mill Creek and the highway over Cooley Mountain. The Bridgeport district embraces the area east of Mill Creek.

VIRTUE AREA

The Virtue area includes the drainage of the tributaries on the south side of Powder River between Glasgow Butte and Fivemile Creek on the east and Magpie Creek on the west.

The Virtue district includes Virtue Flat, which lies mostly within the drainage of Buckles Creek and Second Creek, above the mouth of the latter.

State Department of Geology and Mineral Industries

1069 State Office Building
Portland 1, Oregon

GROUNDWATER RESOURCES IN BAKER COUNTY

Foreword: The objective in the following paragraphs is to review the ways in which groundwater occurs in Baker County and the extent to which the planning committee is justified in regarding it as a reserve source of supply for the County's water needs in the future.

By way of introduction to the subject, there is given first a thumbnail sketch of both surface and subsurface requirements pertinent to the formation of groundwater in general. This is followed in somewhat greater detail by a description of geologic conditions present in the county. These topics are of necessity reviewed in a highly summarized form, except that where it is appropriate to elaborate for the purpose of explaining the significance of certain conditions with respect to groundwater occurrence in the county, greater explanation is given.

Basic groundwater requirements: The soils and loose sediments covering the earth's surface and the bedrocks underlying this mantle constitute the environment in which groundwater occurs. Whether this environment does, or does not, favor the existence of a groundwater potential in any particular geographical area depends on (1) the conditions under which the loose surface materials and their underlying bedrocks occur, (2) the availability of surface waters for charging and recharging subsurface aquifers and (3) the existence of watershed situations capable of entrapping precipitation water and diverting it underground.

All three of these factors must be present and in balance, one against the other for optimum groundwater potential to exist. For example, ideal conditions for the capture and subterranean storage and transfer of ground-

water are to no avail if there is no surface water available to be captured and stored. Neither is an abundance of precipitation water of any avail in places where the surface and subsurface rocks are as tight and impervious as a paved street. In short, for balanced conditions to exist it is essential that within certain limits all required factors occur in the same place at the same time. Thus, precipitation must not only be available in consistently good supply, it must fall on terrain conditions that will enable it to be soaked up with a minimum of loss by evaporation and run-off. At the same time, subsurface reservoir capacity must exist in conjunction with the watershed if water is to be transferred from the saturated soils to a state of subterranean storage. The subsurface storage may be afforded by unconsolidated or semi-consolidated alluvial material or by a bedrock having physical characteristics such as a network of interconnecting fractures, porous textures, or solution cavities that will permit the intake of water and its incorporation in the rock mass. Either way, the existence of suitable subsurface storage conditions is fully as necessary as is the availability of water for storage. Without either, there would be no groundwater.

Subsurface water contained in alluvial material is known as unconfined water. This is the water that soaks into the ground and accumulates on top of some impervious subsurface horizon which may be either an alluvial clay layer or some type of equally impervious bedrock. Although on occasion such water may be deep, it is normally the water encountered in shallow dug wells. It is also the water, the top level of which constitutes the water table. The type of groundwater that is taken up in hosting bedrock and channeled away from the intake area under circumstances where it is carried beneath an impervious overlying strata is known as confined water. This is the water which provides large flowing artesian wells when the proper structural conditions prevail.

County Groundwater potential: Within the county the requirements prerequisite to the occurrence of groundwater are present in a great many combinations. For instance, areas of maximum precipitation tend to be localized in the higher elevations. So also are the areas in which lower temperatures prevail and in which natural vegetation and absorbant soils are best developed. Elsewhere, with progressive decrease in elevation, there is less precipitation on the average and what there is falls on terrain in which protective vegetative and soil conditions are less favorable and hot, windy weather is seasonally more prevalent.

This variability in watershed conditions is enough in itself to account for differences in groundwater potential even if subsurface storage capabilities were uniformly good everywhere. Actually, however, subsurface conditions in the county are far from uniform. Instead, great variations exist with respect to the physical characteristics of the native bedrocks. Furthermore, the areas in which favorable subsurface conditions exist do not coincide in all instances with the area in which the best watershed conditions occur. Accordingly areas with a potential for developing large amounts of groundwater are by no means commonplace while in some parts of the county even small quantities of water are hard to come by.

By and large, the least well-known of the factors influencing groundwater occurrence in the county are those that identify with geologic conditions. This subject is therefore summarized in the succeeding paragraphs. Bedrock geology is reviewed first, that pertaining to recent alluviums last.

The bedrocks are divided into two categories. The first, and oldest, of these constitutes the basement complex underlying the whole of the county. This is made up of a wide variety of sedimentary, volcanic and magmatic rock types. A more detailed description is that the sediments consist of shales, sandstones, conglomerates and limestones, all of which were deposited in marine seas. The volcanic components include lavas, related breccias

and tuffs emplaced, in part, in both terrestrial and submarine environments. The crystalline intrusives are represented mainly by granodiorite, quartz diorite, tonalite, gabbro and albite granite. However, serpentine and a few other lithic oddities occur also, to a much lesser extent.

All of these rocks were emplaced between the middle of the Permian period of geologic time and the end of the Cretaceous. This represents a time span of approximately 180 million years, beginning approximately 250 million years ago and ending approximately 70 million years ago.

As originally deposited, and in the way they existed for many millions of years following their initial consolidation into a solid rock state, many of the sediments and most of their volcanic interbeds undoubtedly possessed the physical characteristics needed to enable them to function admirably as aquifers for the storage and subterranean transfer of groundwaters. Unfortunately, however, the history of events that have transpired since these rocks originated is not one characterized by a simple warping of the earth's crust. Instead, the diastrophic history these sediments and volcanics have experienced has been severe to the point that porous textures and permeability characteristics have been virtually eliminated and physical continuity has been materially disrupted. All member strata exhibit this deformation, some much more so than others. In fact, evidence exists to show that some of the older strata exhibit mineralogical and textural alterations induced by a succession of deformational events.

Introduction of the crystalline rocks took place concurrent with various of the afore mentioned episodes of diastrophism and culminated during the late Cretaceous with the massive emplacements of the granitics constituting the cores of the Wallowa and Elkhorn mountains. Under the circumstances, some of the crystalline rocks, notably the gabbros and albite granites, pre-date some of the sedimentary strata, while others, notably the granodiorites and tonalites, are considerably younger than the youngest sediment.

Also, as in the instance of the sediments, the older crystalline rocks exhibit far more post-emplacement alteration than do the younger ones. Mineralogic changes of this sort are especially prominent in the instance of certain of the gabbros while, conversely, the type of intrusives represented by the Wallowa-Elkhorn granitics remain in a fresh, substantially unaltered condition except for a tendency to disintegrate in the instance of a few select exposures.

Whether fresh or altered, crystalline intrusive rocks host groundwater only to the extent they are laced with a network of inter-connecting fractures. Such fractures may account for many mountain springs but practically never do they constitute a situation which can be developed into a dependable source of large volumes of water. The reason is that the body material of crystalline rock is non-porous, hence not able to absorb and store water in amounts over and beyond the capacity of the fracture system itself. Futhermore, larege-sized networks of inter-connecting, open fractures occur but rarely in crystalline igneous rock.

The appraisal of groundwater potential just given for the igneous rocks applies equally well to the sedimentary and volcanic rock types included in this category. It does so because in the condition which they exist today the sediments and volcanics rate, for all practical intents and purposes, no better than their igneous associates. In short, the tectonic involvements they have experienced over the ages has virtually eliminated whatever native water-storing capacity they may have had originally so that today the reduced potential afforded by fractures and faults is all they have to offer. That this represents penny-ante potential is illustrated amply by the deep mine shafts with extensive lateral workings which exist in many parts of the county. Many are bone dry. Some generate only a trickle. None have encountered water in sufficient volume to constitute a pumping problem from a mining standpoint.

The second, or youngest category of bedrocks in Baker County date from approximately 70 million years ago to approximately one million years ago. This is recognized as the Tertiary period of geologic time. Considered as a unit, all rock formations of Tertiary age are super-imposed unconformably on one or another of the rocks described heretofore. Furthermore, most of them were deposited on an old land surface under what classes as terrestial conditions, and never since their formation have they been deeply buried in the earth's crust or subjected to structural deformations comparable in severity to those experienced by the older formations. Instead, gentle, [illegible] folding and minor faulting constitutes the measure of post depositional disturbance they have experienced.

Considered individually, the Tertiary rocks consist mainly of basalts, andesites, rhyolite breccias and their related cinders and pumiceous tuffs all of which are materials of volcanic derivation. However, fresh water lakes did exist from time to time in various parts of the county during the Tertiary. These were filled with the normal water-borne products of erosion and the air-borne clastic materials of volcanic origin. Some also supported an abundance of diatoms, an algae-like class of plant life capable of growing so prolifically that their skeletal remains accumulated in thick layers on the lake bottoms. As they exist today, therefore, these lakebeds are represented by strata of clays and gravels interbedded with water-laid tuffaceous sand and ash, and, in some instances, with interbeds of diatomaceous earth.

When they exist under the proper conditions, some of the Tertiary volcanics have excellent capabilities for soaking up surface water and transforming it to groundwater. It is the lavas in particular, and especially the basalts, that have this capability the most, and they do because of

the abundance of fracturing and cross-fracturing they acquired while cooling, plus whatever extra fracturing they may have acquired since as a consequence of structural warping and faulting. The largest producing wells in the county pump from basalts or the gravel interbeds which sometimes separate them when several flows occur one on top of the other. Morrissey's irrigation well at the head of Keating Valley and the old California Pacific well and the recently completed Ellingson wells at the head of the Baker Valley are examples. On the other hand, most of the tuffs and the tuffaceous rhyolite breccias have but little capacity to host groundwater in that they are not characterized by either natural prosity nor an abundance of close-interval fracturing. And, except for their gravel interbeds which can and sometimes do, contain groundwater, the lakebeds as a whole have a negliable potential because they are comprised largely of impervious clays and water-laid tuff which is often broken down, at least partially, into a clayish ( ) condition.

What is important with respect to the water-bearing members of the Tertiary is the nature of their occurrence. A thin basalt flow covering only a few acres on the bare rangeland hills, for instance, can never be expected to hold or deliver water in any appreciable quantity compared with an occurrence comprised of a thick sequence of flows, one on top of the other, extending thoughout the best part of a couple townships in an area where surface water is available in good supply. In this connection, the unfortunate circumstance is that while Tertiary lavas are widely distributed in the county, a large percent of the individual occurrences are of the erossional remnant type---small in areal extent and all too frequently poorly located with reference to advantageous watershed conditions. Conversely, thick sequences covering large areas are comparitively infrequent. Accordingly,

therefore, while it is to be anticipated that more large-yield wells will eventually be developed in the county from such sources, their number is limited by the comparative scarcity of occurrence situations capable of supporting large-yield wells.

The third category of materials, namely soils, the natural products of rock decay, and transported sediments of recent to near recent origin, occur throughout the entire county. These are superimposed, in one place and another, and to varying extents, on all the previously mentioned bedrocks, Tertiary and pre-Tertiary alike.

Whereas the soils are of great importance in terms of groundwater, and particularly so with respect to the watershed phase of the subject, it is the transported sediments that constitute the aquifers. In the county, these sediments consist, principally of (1) glacial erosion products in some of the higher mountains, (2) bench and terrace gravels related historically to the present-day and near-recent drainage systems, (3) fan-like accumulations of alluvial gravels located along the borders of some valleys at points entered by creeks with capacities enough to carry coarse sediments in substantial quantities during flood stages, and (4) sheets of sedimentary materials spread by meandering streams across the floors of valleys in which erosional down-cutting has been arrested.

The sand and gravel components of such sediments are capable of carrying water and are, in fact, the source of countless springs and domestic wells and stock resevoirs. Of the various kinds of occurrences, the alluvial fans and the sheets of sediments that veneer the surface of the larger valleys are the most important. However, because these sources have been utilized so extensively they are probably already over-developed in some areas, though certainly not in others. In any event, future development

from such sources will be spotty because suitable occurrences themselves are localized and because many of the remaining underdeveloped ones are located where there is little or no immediate user need for additional water. At best, circumstances under which recent alluvial deposits can be expected to yield water in sufficient volume at any one place to support a large irrigation project or to meet heavy industrial requirements are rare, if not non-existent.

Summary and conclusions: From what has been explained in the preceeding paragraphs, it should be evident that geologic conditions favorable to the intake, storage and transfer of groundwater are not commonplace. Instead, they are localized in their occurrence and quite frequently relatively small in both areal extent and potential. Furthermore, they are not always situated advantageously with reference to optimum watershed environments or to user needs. For these reasons, and even though several notably satisfactory wells attest to the fact that favorable conditions do exist for the development of groundwater in some parts of the county, the overall picture is that groundwater can not safely be regarded as a source of reserves capable of contributing materially to the county's future needs, except locally, in certain select places. Under the circumstances, therefore, and for purposes of planning on a long range, county-wide basis, groundwater had best be regarded as a supplemental source of supply strictly secondary in importance to surface run-off water which still exists, seasonally, in amounts greater than existent resevoirs have the capacity to hold. Accordingly, studies dealing with increased efficiency in the management of surface water should be given priority in any present day appraisal involving eventual development of large water reserves.

Report by: N. S. Wagner
November 25, 1965

NSW/lc

FROM

Geological Survey Bulletin #875 "Nonmetallic Mineral Resources of Eastern Oregon" - United States Department of the Interior.

"Occasionally references may be found to a gypsum deposit near Gypsum station, in the Snake River Canyon. According to Lindgren * 1,800 tons of gypsum was mined here in 1896. There has been no production for a long time, and the large mill built has been dismantled. Lindgren gives the following section of the gypsiferous beds, which occurred near the canyon rim:

Gypsiferous limestone and volcanic tuff.	Feet
Gypsum	30-40
Red and green tuffaceous slate	80
[redacted] Gypsum	20
Slate and limestone	

The average strike of the beds is N. 60° E. and the dip is about 30° NW. The gypsum was completely mined out by a series of workings, and all that is now left is the unaltered anhydrite. Careful prospecting should have warned the operators of the transition of the gypsum into anhydrite and prevented the loss of capital that was incurred. Prospecting might reveal other occurrences of the anhydrite bed near the surface where weathering would have hydrated it to gypsum. It is possible that the present deposit of anhydrite might be utilized if processes investigated by the United States Bureau of Mines** for the hydration of anhydrite can be perfected. So far as known this is the only body of anhydrite in Oregon. No commercial gypsum deposits are known.

*Lindgren, Waldemar, The gold belt of the Blue Mountains of Oregon: U.S. Geol. Survey 22d Ann. Rept., pt. 2, p. 753, 1901

** Farnsworth, Marie, The hydration of anhydrite: Ind. and Eng. Chemistry, vol. 17, pp. 967-970, 1925

STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

Bibliography of the Geology and Mineral Resources of Baker County and Adjacent Areas*

Anderson, A. C.
1954 — Soil survey of Baker area, Oregon U. S. Dept., Agriculture in cooperation with Oregon Agriculture Experiment Station, Ser. 1941, No. 9, 1954.

Appling, Richard N.,Jr. — Manganese Deposits of Northeastern Oregon: USBM, Report of Investigators, 5472.

Bibliographies:

For a more complete coverage of geologic publications the reader is referred to the following bibliographies of which those covering theses are particularly pertinent in that they list the identity and location of important, but unpublished, reports.

Bibliography of the Geology & Mineral Resources of Oregon, (to 1936): State Planning Commission; 1936 through 1945; 1945 through 1950, 1950 through 1955, Bulletins 33, 44 & 53, State Dept. Geology & Mineral Industries.

Bibliography of Theses in Oregon, State Dept. Geology & Mineral Industries, Miscellaneous Paper No. 7, 1959. Also Ore.-Bin, Vol. 23, No. 11, 1961, Vol. 24, No. 1, 1962 & Vol. 24, No. 11, 1962.

Bostwick, David A.
1962 — Permian & Triassic rocks of Northeastern Oregon. Geological Society of America, Bulletin 73, March 1962.

Bowman, F. Jean
1943 — Vertebrate fossils from the Ironside Mountain quadrangle, Oregon; In Lowry, The geology of the northeast quarter of the Ironside Mountain quadrangle, Baker and Malheur counties, Oregon: University of Rochester Ph.D. Thesis, 1943.

Condon, Thomas
1902 — Two islands, and what came of them: J. K. Gill Co., Portland, Oregon, 1902.

Cook, Earl F.
1954 — Late Pleistocene Age of the Snake River division: Geological Society of America, Bull., Vol. 65, No. 12, Dec. 1954.

---

*Most of these publications may be consulted at public libraries or at libraries of educational institutions and state geological surveys.

Dicken, Samuel N.
1950 — Oregon geography: Edwards Bros., Ann Arbor, Michigan, 1950. (For sale by J. K. Gill Co., Portland, Oregon, for $1.95).

Fitzsimmons, J. Paul
1949 — Petrology of the southwest quarter of the Pine quadrangle, Oregon: Wash. Univ. Ph.D. Thesis, 1949 (copy in Department library).

Frederickson, A. F.
1950 — The behavior of some diabase and basalt dilation dikes in the Union Companion mine, Cornucopia, Oregon: Econ. Geology, vol. 45, no. 3, May 1950.

Freeman, Otis W.
1938 — The Snake River Canyon: Geog. Rev., vol. 28, no. 4, Oct. 1938.

Gilluly, James
1933 — Replacement origin of the albite granite near Sparta, Oregon: U. S. Geol. Survey Prof. Paper 175-C, 1933 (out of print).

1933 — Copper deposits near Keating, Oregon: U. S. Geol. Survey Bull. 830-A, 1933 (out of print).

1937 — Geology and mineral resources of the Baker quadrangle, Oregon: U. S. Geol. Survey Bull. 879, 1937 (out of print).

Gilluly, James, Reed, J. C., and Park, C. F., Jr.
1933 — Some mining districts of eastern Oregon: U. S. Geol. Survey Bull. 846-A, 1933 (out of print).

Gillson, J. L.
1955 — Industrial minerals in 1954: Mining Congress Journal, vol. 41, no. 2, Feb. 1955.

Goodspeed, George E
1939 — Pre-Tertiary metasomatic processes in the southeastern portion of the Wallowa Mountains of Oregon: Sixth Pacific Sci. Cong. Proc., p. 399-422, 1939.

1941 — Geology of the gold quartz veins of Cornucopia: A.I.M.E. Trans., vol. 144, p. 172-189, 1941.

1948 — Origin of granites: In Gilluly, Origin of granite: Geol. Soc. Am. Memoir 28, p. 55-78, 1948.

(Prof. Goodspeed has published considerable petrographic data on intrusive rocks in the southeastern part of

Wallowa Mts. near Cornucopia, Oregon. For other references see: Bibliography of geology and mineral resources of Oregon: Oregon Dept. Geology and Mineral Industries Bulletins 33, 44 and 53).

Grant, U. S., and Cady, G. H.
1914 — Preliminary report on the general and economic geology of the Baker district of eastern Oregon: Oreg. Bur. Mines and Geol. Mineral Resources of Oregon, vol. 1, no. 6, 1914 (out of print).

generally superseded by Gilluly

Hamblen, K. E
1950 — Perlite in Oregon, Washington & Idaho: Raw Materials Survey Newsletter Feature Reprint, June 1950.

Hay, Oliver P.
1927 — The Pleistocene of the western region of North America and its vertebrated animals. Carnegie Inst. Wash. Pub. 322 B, 1927 (out of print).

Hewett, Donnel F.
1931 ? — Zonal relations of the lodes of the Sumpter quadrangle: A.I.M.E. Trans., p. 305-346, 1931.

Kaufman, Albert J.Jr.
1955 — The mineral industry of Oregon: U. S. Bureau of Mines Yearbook, vol. 3, (1952), 1955.

Libbey, F. W.
1957 — Limestone Resources of the Pacific Northwest: Raw Materials Survey, Inc., Resource Report No. 9.

Lindgren, Waldemar
1901 — The gold belt of the Blue Mountains of Oregon: U. S. Geol. Survey 22nd Annual Report, pt. 2, 1901 (out of print).

1933 — Ore deposits of the western United States: Lindgren Volume, A. I. M. E., 1933.

Livingston, Douglas C.
1925 — A geologic reconnaissance of the Mineral and Cuddy mining districts, Washington and Adams counties, Idaho: Idaho Bur. Mines and Geol. Pamphlet 13, 1925 (out of print).

1928 — Certain topographical features of northeastern Oregon and their relation to faulting: Journal Geology, vol.36, no. 8, Nov.-Dec. 1928.

Lorain, S. H.
1938 — Gold mining and milling in northeastern Oregon: U. S.

Bureau Mines Inf. Circ. 7015, 1938

Lowry, Wallace D.
1943 Geology of the northeast quarter of the Ironside Mountain quadrangle, Baker and Malheur counties, Oregon: Univ. Rochester Ph.D.Thesis, 1943 (in Department library).

McDivitt, James F.
1952 A report on gypsum deposits in Washington County, Idaho: Bur. Mines and Geology Pamph. 93, 1952.

Generally applies to the Oregon occurrences as well, with many known additional background of knowledge having been worked out early in the century —

Merriam, John C.
1916 Mammalian remains from Ironside, Oregon: Univ. Calif. Pub. in Geol., vol. 10, no. 9, 1916 (out of print).

Moore, Bernard N
1937 Nonmetallic mineral resources of eastern Oregon: U. S. Geol. Survey Bull. 875, 1937 (out of print).

Norberg, Bror
1952 Cement industry's expansion program summarized: Rock Products, vol. 54, no. 1, Jan. 1951 and vol. 55, no. 1, Jan. 1952

Oregon Department of Geology and Mineral Industries
1939 Oregon metal mines handbook; Baker, Union, and Wallowa counties: Oregon Dept. Geology and Mineral Industries Bull. 14-A, 1939 (out of print).

Pardee, Joseph T.
1909 Faulting and vein structure in the Cracker Creek gold district, Baker County, Oregon: U. S. Geol. Survey Bull. 380, 1909 (out of print).

1910 Placer gravels of the Sumpter and Granite districts, eastern Oregon: U. S. Geol. Survey Bull. 430, 1910 (out of print).

1921 Deposits of manganese ore in Montana, Utah, Oregon and Washington: U. S. Geol. Survey Bull. 725-C, 1921 (out of print).

Generally superseded by Appling

Pardee, J. T., and Hewett, D. F.
1914 Geology and mineral resources of the Sumpter quadrangle, Oregon: Oreg. Bur. Mines and Geology, Mineral Resources of Oregon, vol. 1, no. 6, 1914 (out of print).

Pardee, Joseph T., and others
1941 Preliminary geologic map of the Sumpter quadrangle, Oregon: Oregon Dept. Geology and Mineral Industries map with text, 1941 (For sale by Department, 40¢).

Parks, Henry M.
1914 The building stones of Oregon: Oregon Bur. Mines and

Geology Mineral Resources of Oregon, vol. 1, no. 2, 1914 (out of print).

Parks, Henry M., and Swartley, A. M.
1916 ? Handbook of the mining industry of Oregon: Oregon Bur. Mines and Geology Mineral Resources of Oregon, vol. 2, no. 4, 1916 (out of print).

Prostka, Harold J.,
1962 Geology of the Sparta Quadrangle, Oregon: Dept. of Geology and Mineral Industries, 1962.

Reed, J. C., and Gilluly, James
1932 Heavy mineral assemblages of some of the plutonic rocks of eastern Oregon: Am. Mineralogist, vol. 17, p. 201-220, 1932.

Richards, Leslie C. and Bartell, A. D.
1952 Lime for the Pacific Northwest: Raw Materials Survey, Resources Report No. 6.

Ross, Clyde P.
1938 The geology of part of the Wallowa Mountains: Oregon Dept. Geology and Mineral Industries Bull. 3, 1938 (~~for sale by Department, 50¢~~). (Out of print).

Smith, W. D., and Allen, J. E.
1941 Geology and physiography of the northern Wallowa Mountains, Oregon, with petrography by Lloyd W. Staples and glaciation by Wayne R. Lowell: Oregon Dept. Geology and Mineral Industries Bull. 12, 1941 (out of print).

Swartley, Arthur M.
1914 Ore deposits of northeastern Oregon: Oregon Bur. Mines and Geology Mineral Resources of Oregon, vol. 1, no. 8, 1914 (out of print).

Taubeneck, William H.
1955 Age of the Bald Mountain batholith, northeastern Oregon: Northwest Science, vol. 29, No. 3, Aug. 1955.

1955 Age of the Elkhorn Ridge argillite, northeastern Oregon, Northwest Science, vol. 29, no. 3, Aug. 1955.

1957 Geology of the Elkhorn Mountains, northwestern Oregon, Bald Mountain batholith: Geological Society of America: Bulletin, vol. 68, no. 2, Feb. 1957.

Theses - See Bibliography-

Trauger, Frederick D.
1951 Ground-water resources of Baker Valley, Baker County, Oregon: U. S. Geol. Survey in cooperation with U. S. Bur. Reclam. and Oregon State Engineer, unpub. rpt., 1951 (copy in Department library).

Utley, Harry F., 1955 — Big Oregon deposit yields high calcium limestone for industrial use: Pit & Quarry, vol. 47, no. 12, June 1955.

U. S. Bureau Mines — Minerals Yearbooks-- all years--

Wagner, Norman S.
1944 — Antimony in Oregon: Oregon Dept. Geology and Mineral Industries Short Paper 13, 1944 (for sale by Department, 15¢).

1946 — Notes on building-block materials of eastern Oregon: Oregon Dept. Geology and Mineral Industries Short Paper 14, 1946 (for sale by Department, 10¢).

1946 — Birch Creek cinder occurrence, Baker County, Oregon: Oregon Dept. Geology and Mineral Industries Ore.-Bin, vol. 8, no. 8, Aug. 1946.

1950 — The Snake River counties and their mineral resources: Agriculture Bulletin 167, Sept. 1950 (Oregon State Dept. Agriculture, Salem, Oregon).

1952 — A new agate occurrence: Oregon Dept. Geology and Mineral Industries Ore.-Bin, vol. 14, no. 8, Aug. 1952 (near Unity).

1955 — Summary of Wallowa Mountains Geology: Geology and Mineral Industries Ore.-Bin, vol. 17, no. 5, May 1955.

1958 — Occurrences of Peridotite-Serpentine in Oregon: Geology and Mineral Industries Ore.-Bin, vol. 20, no. 2, Feb.1958.

1958 — Limestone Occurrences in Eastern Oregon: Geology and Mineral Industries Ore.-Bin, vol. 20, no. 5, May 1958.

1958 — Important Rock Units of Northeastern Oregon: Geology and Mineral Industries Ore.-Bin, vol. 20, no. 7, July 19558.

1959 — Mining in Baker County, 1861-1959: Geology and Mineral Industries Ore.-Bin, vol. 21, no. 3, March 1959.

Copy from Sent you - Shortly historical except for the "smelter" angle so frequently proposed as a cure-all for todays economic ailments with respect to gold mining.

Wells, R. R., and Agey, W. W.
1947 — Concentration of oxide manganese ore from Sheep Mountain property, Durkee district, Oregon: U. S. Bureau Mines Rpt. Invest. 4149, 1947.

Westgate, Lewis G.
1921 — Deposits of chromite in eastern Oregon: U. S. Geol. Survey Bull. 725-A, 1921 (out of print).

Wheeler, Harry E.
1954 — Structural and Stratigraphic significance of the Snake

River Capture, Idaho-Oregon: Journal Geology, vol. 62, no. 6, 1954. American Geological Institute, Geological Abstracts, vol. 2, no. 4, Dec. 1954.

Williams, Howel
1953 — The ancient volcanoes of Oregon: Condon Lecture 1, Oregon State System Higher Ed., Rev. Ed., 1953 (for sale by Univ. of Oregon, Eugene, Oregon, $1.25).

Wray, Charles F.
1946 — The geology of the northwest quarter of the Ironside Mountain quadrangle, Grant and Baker counties, Oregon: Univ. of Rochester Master's Thesis, 1946 (copy in Department library).

York, Harold A.
1939 — The history of the placer mining era in the State of Idaho: Oregon Univ. Master's Thesis, 1939 (copy in Department library).

Hell only knows how this got included here - or why. Maybe the guy's remarks apply to some phases of Oregon placering or are generally well worded as to reviewing placer history at large, or something. I just don't recall me using or the other now —

Cory

Name of Property	Mineral	County	District	Date	Report by
ohnson Mine	Gold	Baker	Baker	5/17/43	NSW
t. View Clay Property	Fire clay	Baker	Baker	3/1/43	NSW
The North Powder Mine	Gold	Baker	Baker	3/3/43	NSW
Dream Group	Gold	Baker	Baker	8/29/41	HKL
Gold Bug Mine	Gold	Baker	Baker	8/29/41	HKL
Salmon Creek Claims		Baker	Baker	6/8/39	JEA
Stices Gulch Placer		Baker	Baker	5/5/41	HKL
Sutton Creek Mine	Gold	Baker	Baker	5/6/41	HKL
Sutton Creek Mine - Supplement				8/29/41	HKL
McLean Dry Washer	Gold	Baker	Baker	9/16/39	JEA
Report on The Washington Gulch Placer Mine		Baker	Baker	?	C.W. Riddell
Wilson Placer Claims		Baker	Auburn	7/8/40	HKL
Zimmerman Prospect	Gold	Baker	Baker	9/15/39	JEA
Benson Placer Claims	Gold	Baker	Connor Creek	3/18/41	HKL
Cornucopia Gold Mines	Gold	Baker	Cornucopia	6/18/41	HKL
Pebble Cold Spring Mining Co.	Gold	Baker	Cornucopia	6/6/40	HKL

OUR MINING

With the closing of the year Baker county has two gold quartz mines on a good scale of production. These are the Cornucopia mines in the northern part of the county and the Highland-Maxwell mine on Rock creek northwest of Baker. There are other properties producing on a smaller scale, such as the mines of the Chicken Creek district, the Regan mine on Pedro mountain, the Macey mine east of Baker and the New York mine near Granite.

The most severe blow to the mining industry during the year was the closing this month of the Balm Creek mine near Keating. This property had been in production over two years and in that time had produced near $300,000. The point was reached where consderable development work was required to provide ore for the mill. With this condition, the lack of finances to do the work, together with the high cost of pumping and operating it was decided to close the mines.

There is another side to the picture which is not so dark. The development of the past year has been encouraging in at least two spots. One is at the Argonaut mine north of Sumpter where ore bodies have been encountered that give promise of making a large producer. Development is being continued at this mine during the winter with the expectation that it will be ready for a reduction plant in the spring.

Another bright spot is at the Ibex mine in the Sumpter section. During the year development has opened large bodies of ore and it is expected this property will have a mill under construction early in the coming year.

The Sumpter Dredging company has had its boat in Sumpter valley in continuous operation during the year. This operation is much in the nature of a large manufacturing plant. It continues day and night through the year. Its success is due to "quantity production." About 290,000 cubic yards of gravel were dug and washed through the boat in the last month. Thus with the recovery of but a few cents in gold per cubic yard of the material handled, it becomes a profitable operation for the company.

The usual placer operations along the mountain streams have been witnessed during the year and with the coming of spring these will be resumed.

In the Granite district west of Sumpter testing for dredge lands along the streams has ruled and there is promise that one and probably two more of this character of operations will get underway in that section during 1938.

Ent. the News Baker 1/3/37

BAKER COUNTY

Monroe Baum ?

BLANK A—ANNUAL REPORT—Domestic Corporations. **Schedule of License Fees on Back of Report**

ANNUAL REPORT TO THE CORPORATION DEPARTMENT

FOR THE YEAR ENDING JUNE 30, 1936

Of MONARCH GOLD DREDGING CO.
(Give legal name in full)

a corporation organized and existing under and pursuant to the laws of the State of Oregon.

The location of its principal office is at No. Hotel Baker *Street,*

in the city of Baker, *in the state of* Oregon

The names and addresses of principal officers, with the postoffice address of each, are as follows:

NAMES	OFFICE	BUSINESS ADDRESS
W. A. Noon	President	Baker, Oregon
W. J. Noon	Secretary	do
do	Treasurer	do

The date of the annual election of officers is 2d Monday in May

The date of the annual election of directors is do

	Common With Par Value	Common No Par Value	Preferred
Amount of authorized capital stock	$ 300,000.00	Shares	$
Number of shares of authorized capital stock	600,000		
Par value of each share	$ .50	xxxxxx	$
Amount of capital stock subscribed	$ 200,000.00	Shares	$
Amount of capital stock issued	$ 217,276.00	Shares	$
Amount of capital stock paid up	$ 17,276.00	Shares	$
Price at which no par value stock issued	xxxxxx	$	xxxxxx

State amount of capital, represented by stock of no par value, with which the corporation began business . . . . . $

IN WITNESS WHEREOF, I, W. A. Noon, President *of said corporation, have signed this report, this*

[CORPORATE SEAL]

18th *day of* June, *A. D. 193*6

(signed) W. A. Noon

STATE OF OREGON,
County of } *ss.*

I, ... *of the above and foregoing named corporation, being first duly sworn, depose and say, upon oath, that the foregoing*

BLANK B—ANNUAL REPORT

Morning Star

This report must be properly executed and filed with the Corporation Commissioner on or before July 1, 1930, in order to entitle a corporation mining for any of the precious metals, coal, or prospecting or operating for oil, or operating an oil well, to pay a license fee of only $10. If not so filed, such corporation must pay the same license fees as are required to be paid by other corporations for gain.—Section 6890, Oregon Laws.

Annual Report to the Corporation Department

FOR THE YEAR ENDING JUNE 30, ~~1930~~ 1937

Of MORNING STAR MINING COMPANY,
(Give legal name in full)

a corporation organized and existing under and pursuant to the laws of the State of Oregon.

The location of its principal office is at No. 431 Lyon Bldg. *Street, in the city of* Seattle, *in the state of* Washington

The names and addresses of principal officers, with the postoffice address of each, are as follows:

NAMES	OFFICE	BUSINESS ADDRESS
E. H. TERWILLIGER	President	431 Lyon Bldg., Seattle, Wash.
L. H. WHEELER	Secretary	do
	Treasurer	

The date of the annual election of officers is 1st Tuesday of June

The date of the annual election of directors is do

	Common With Par Value	Common No Par Value	Preferred
Amount of authorized capital stock	$ 25,000.00	Shares	$
Number of shares of authorized capital stock	500,000		
Par value of each share	$ .05	xxxxxx	$
Amount of capital stock subscribed	$ 15,000.00	Shares	$
Amount of capital stock issued	$ 11,495.00	Shares	$
Amount of capital stock paid up	$ 15,000.00	Shares	$
Price at which no par value stock issued	xxxxxx	$	xxxxxx

State amount of capital, represented by stock of no par value, with which the corporation began business . . . . . $ none

Total amount of its properties in Oregon (name of claims, lodes, or placers)

Morning Star Nos. 1, 2, 3, 4 and 5 and Wedge

The location of its properties Baker County

The amount of work done thereon and improvements made thereon since the time of filing last report about $200 and more in progress

The amount of output or products of the mines or wells of such corporation from January 1, 1929, to December 31, 1929, inclusive, none

The value of output or products of the mines or wells of such corporation from January 1, 1929, to December 31, 1929, $ none

IN WITNESS WHEREOF, I, E. H. TERWILLIGER *of said corporation, have signed this report, this* ..... *day of* June, *A. D. 193*7.

[CORPORATE SEAL]

(not signed)
Deposition signed by E. H. Terwilliger

STATE OF OREGON,

County of ..... } *ss.*

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

ASSAY REPORT Office Number 51-52-53-7-8

Grants Pass, Oregon
Baker, Oregon

July 8, 1938

Sample submitted by Allen (Berkeley property)

Sample description

The assay results given below are made without charge as provided by Chapter 176, Section 10, Oregon Laws 1937, the sender having complied with the provisions thereof.

NOTICE: The assay results given below are from a sample furnished by the above named person. This department had no part in the taking of the sample and assumes no responsibility, other than the accuracy of the assay of the material as furnished it by the sender.

Sample Number	GOLD		SILVER						Total Value
	Ounces per ton	Value	Ounces per ton	Value	Percent	Value	Percent	Value	
1	.59	$20.65	Nil	---					$20.65
2	.61	$21.35	Nil	---					$21.35
3	.02	$ .70	Nil	---					$ .70

Market Quotations:

Gold	$35.00	per oz.
Silver	$	per oz.
	$	per lb.
	$	per lb.

State Assay Laboratory

Assayer

SEP 29 1986

ASH GROVE CEMENT WEST, INC.

330 CEMENT PLANT ROAD
P.O. BOX 5
DURKEE, OREGON 97905
(503) 877-2411

September 25, 1986

Mr. Howard Brooks
Dept. of Geology & Mineral Industries
Baker Field Office
1831 First Street
Baker, OR 97814

Dear Howard:

Attached is a copy of your sheet filled out with tons sold.

I could not come up with sales dollars for the early years but you can probably make some estimates if you need to.

I gave a summary of this information to Dan Avey over the phone and he was going to make some estimates on dollars for his project.

I hope you all enjoyed your tour.

Very truly yours,

ASH GROVE CEMENT WEST, INC.

RCooke

Richard E. Cooke
Plant Manager

REC:mm

Figures on the first page of the attached are from the U.S. Bureau of mines records. Second page furnished by Cooke. Combined production from Lime and Durkee totals 7,705,984 tons of cement sold which at current price ($60) = $462,359,000 Cooke said limestone production at Lime ended in 1965. Shale was produced there for several ensuing years. Rock shipped to L Oswego plant not included which is significant.

(Computer Print-outs)

Commodity Quantities and Values - Baker Co.

Year	1 Finished Portland Cement — Production (tons)	2 Sales (tons)	3 Sales $	4 Portland Cement — Sales Tons	5 $	6 Lime — Tons	7 $	8 Limestone & Dolomite — Tons	9 $	10 Chemical Lime Co. — Quicklime Tons	11 Hydrated Lime Tons	12 $
…4	490,892	455,592	29,438,964	Fint and Durkee		Chemical Lime Co.						
…3	437,404	261,470	14,322,047									
…2	246,192	181,965	10,964,291									
	381,219	281,417	16,263,088									
…2	356,631	277,643	15,367,079									
…1	202,104	234,819	12,544,216									
…5	204,748	244,388	11,979,640			~~Prod~~						
…7				198813		~~7590~~						
…6		1,431,294		218225		~~7295~~						
…5				186606		~~7078~~						
…4				206,451	5,640,680			505,172	1,115,351			
…3				217,069	4,724,257							
…2				196,425	4,344,784							
…71				154,362	3,669,937							
…70				143,713	3,043,492	6800	138,000					
…69				142,451	2,880,172	20,878	365,680					
…68		3,611,548		174,663	3,334,625	25,128	432,276			23,425 sold	1,700 sold	432,276
…67				157,114	3,440,511	19,563	391,898			16,559 sold	3,004 sold	391,898
…66				246,649	4,821,408	23,240	420,628			21,350 sold	1890 sold	420,628
…65				140,935	2,765,777	20,750	332,600			18,150 sold	2,600 sold	332,600
…964				118,718	2,341,738	34,163	717,873			31,163 sold	3,000 sold	717,873
…963				191,951	3,495,435	44,425	926,022			40,825 Prod	3,600 Prod	926,022
…962				107,718	2,181,795	36,367	695,239			33,980 Prod	2387 Prod	695,239
…961				120,425	2,336,875	41,447	865,657			39,446 Prod	2,001 Prod	
…960				219,623	4,143,988	35,204	703,055			32,969 Prod	2,235 Prod	703,055
…959				132,907	2,571,497	34,683	693,660					
…958				202,198	3,797,618	33,000	644,000					
…957				134,541	2,459,758	1727	27,500					
…956				99,626	1,783,561							
…955				91,215	1,544,837							
…954				101,380	1,780,165							
…953				84,783	1,365,209							
…952				88,886	1,382,159							
…951				96,446	1,497,122							
…950				76,639	1,166,483							
…949				74,676	1,107,394							
…948		2,157,142		79,399	1,150,522			HOUSTOWN				
…947				80,243				80618				
…946				79,347				77653				
…945				70,988				67395				
…1944				44,449				51344				
				~~847675~~				4354088				

Cement sold

2,705,984 tons x $60 (current price) = 462,359,040

7,705,984 x 60

$462,300,000

	SOLD	PRODUCED
1943	83729	82721
1942	90576	91150
1941	87145	72607
1940	92454	41844
1939	96186	95966
1938	38576	39890
1937	47087	50568
1936	48807	48877
1935	63104	56472
1934	29676	34162
1933	12342	13710
1932	27252	31579
1931	81190	72883
1930	60589	69881
1929	45898	49720
1928	43689	39199
1927	45382	47497
1926	66581	68325
1925	68503	71251
1924	54024	52325
1923	775	4760
	5,768,690	