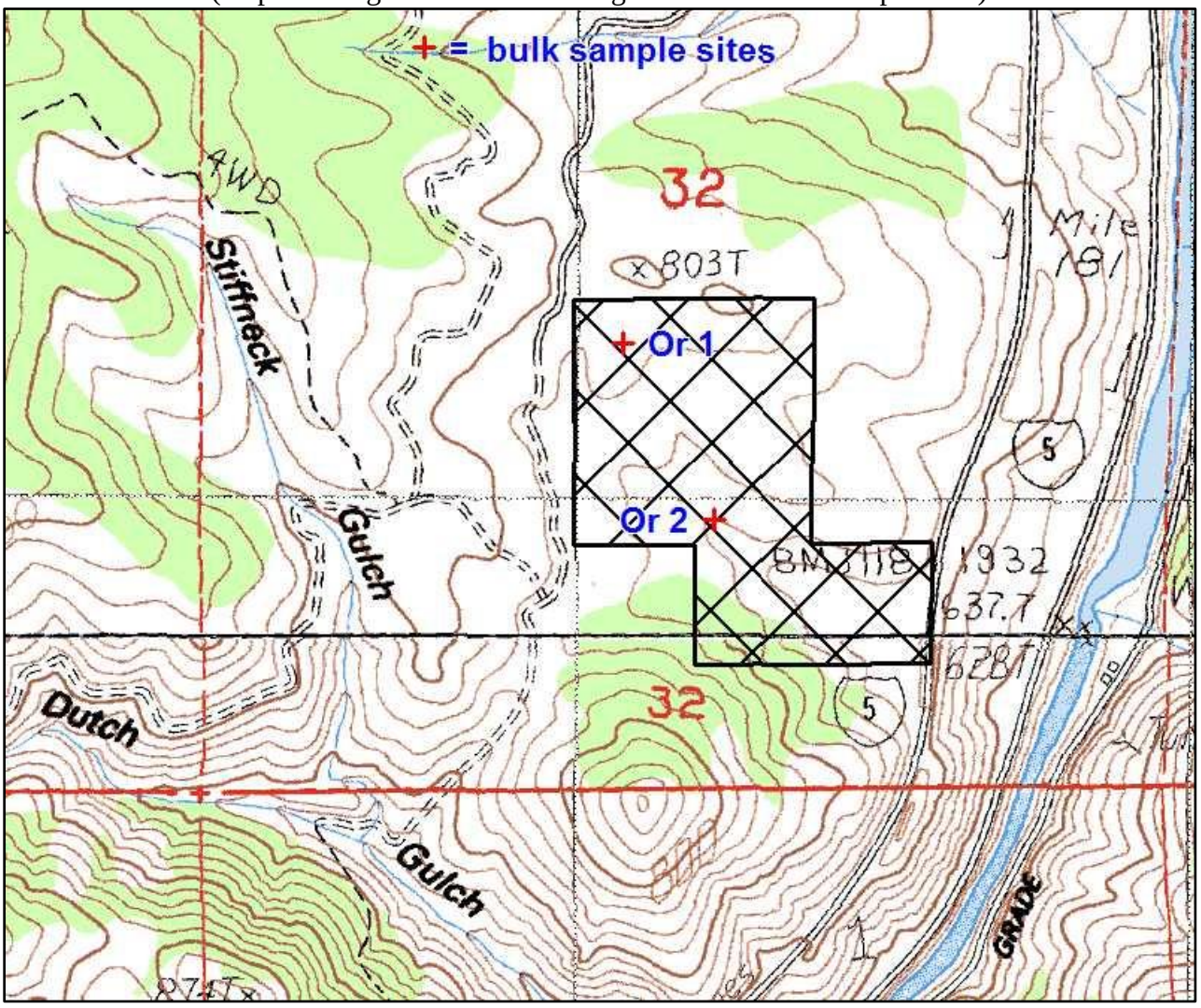
Compilation Summary of C.J. Orback and Kerr-McGee Corp work on Hornbrook Conglomerate

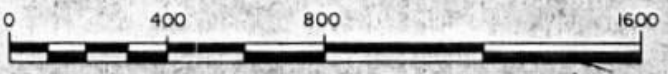
Between 1980 and 1986, a series of bulk samples (2 tons each) were taken of the auriferous Hornbrook Conglomerate in Northern California near the Oregon border and processed near Grants Pass area of Southern Oregon. The work was carried out / supervised, in 1981, by C.J. Orback, a consulting Geologist working for a private Group of Associates. Later, Kerr McGee Corporation acquired the "Conglomerate Property" and expanded upon the previous work of Orback.

Overall, the work was carried out on about five lineal miles of the Auriferous Conglomerate. Two of the bulk samples initiated by Orback were on the conglomerate body within the Blue Gravel area, which was designated (within Project) as "Area IV" or "Area 4". These were assigned sample nos. "Or 1" & "Or 2"

These two samples were taken of the Hornbrook Conglomerate near the bedrock and assayed at .0475 opt gold and .0471 opt gold respectively.

(map showing Blue Gravel mining claim w/Orback sample sites)





SCALE : 1" = 400'

PROGRESS REPORT - _____

KERR-McGEE CORPORATION

MINERALS EXPLORATION DIVISION

REVISIONS	GEOLOGY BY: RDA
	DRAFTED BY: JGJ
	DATE:

HORNBROOK PROJECT

GEOLOGY & SAMPLES

Siskiyou Co., California

SHEET 3 OF 3

SCALE: 1" = 400'

MAP NO.:

FILE NO.:

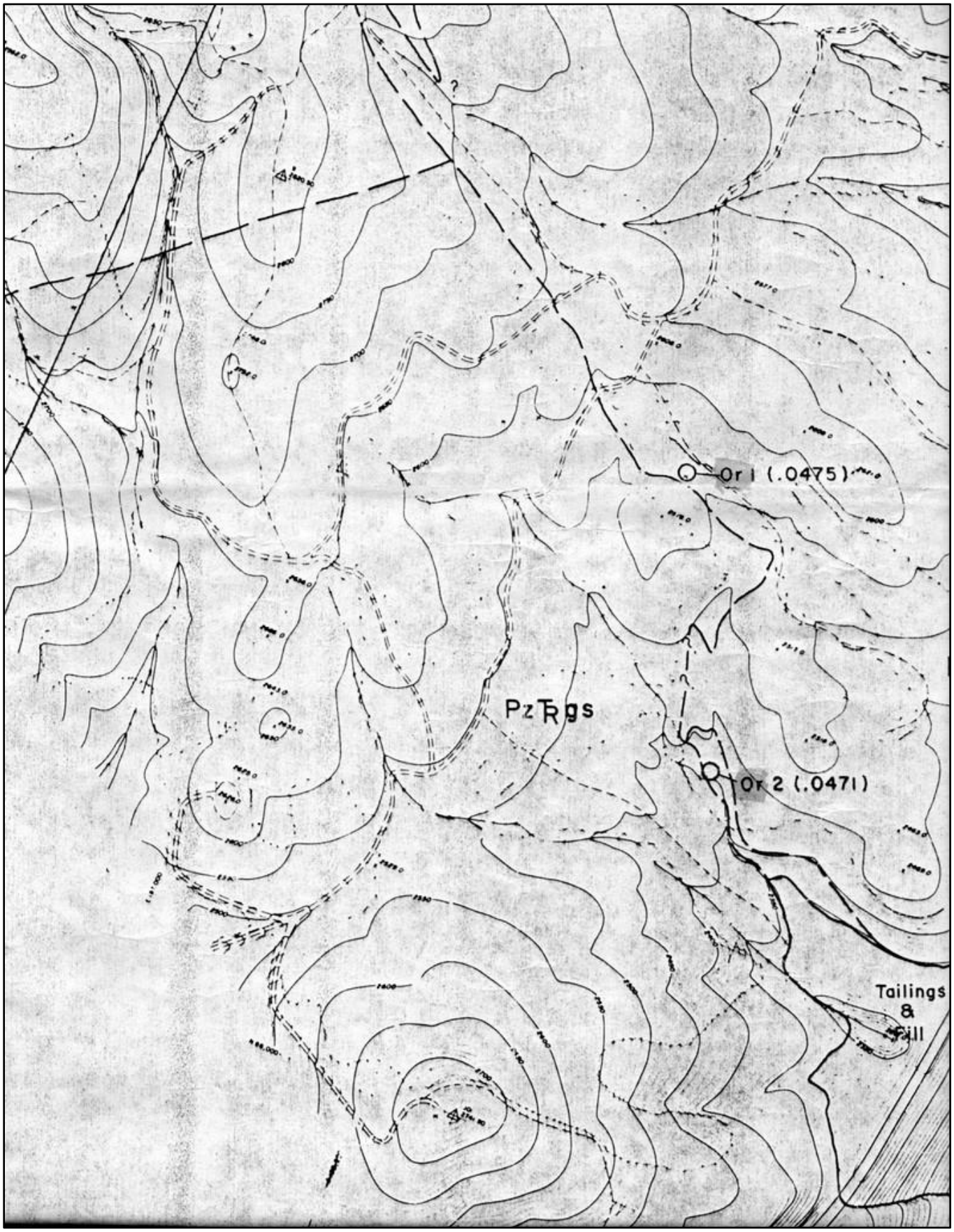
EXPLANATION

Khis	Cretaceous Hilt Sandstone
Khic	Cretaceous Hilt Conglomerate
Khos	Cretaceous Hornbrook Sandstone
Khoc	Cretaceous Hornbrook Conglomerate
PzTRms	Paleozoic - Triassic Metasediments
PzTRgs	Paleozoic - Triassic Greenstone

GOLD VALUES

oz. / ton

KERR - McGEE	ORBACK	
△	○	> .100
△	○	.060 - .099
△	○	.040 - .059
△	○	.020 - .039
△	○	< .020

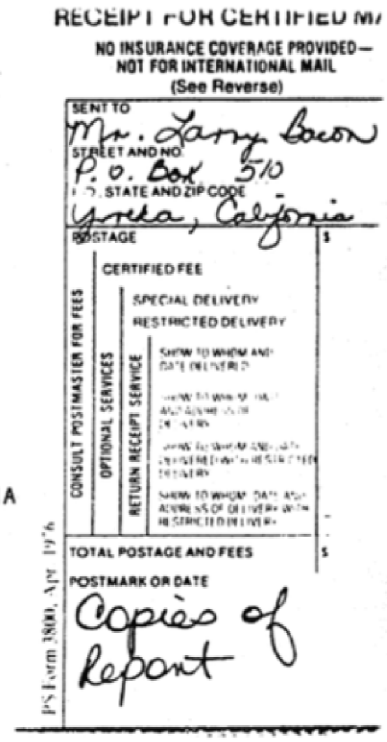

Or 1 (.0475)
PzTRgs
Or 2 (.0471)
Tailings
&
Fill

REPORT ON

HORNBROOK CONGLOMERATE

SOIL AND BULK SAMPLING,

SISKIYOU COUNTY, CALIFORNIA


RECEIPT FOR CERTIFIED MA
NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL
(See Reverse)
SENT TO
Mr. Larry Bacon
STREET AND NO.
P.O. Box 510
P.O., STATE AND ZIP CODE
Yreka, California
POSTAGE $
CERTIFIED FEE
SPECIAL DELIVERY
RESTRICTED DELIVERY
SHOW TO WHOM AND DATE DELIVERED
CONSULT POSTMASTER FOR FEES
OPTIONAL SERVICES
RETURN RECEIPT SERVICE
TOTAL POSTAGE AND FEES $
POSTMARK OR DATE
Copies of Report
PS Form 3800, Apr. 1976

FOR

MR. A. D. MAMMEL AND ASSOCIATES

DALLAS, TEXAS

BY

C. J. ORBACK

TUCSON, ARIZONA

AUGUST 1981

INTRODUCTION

Between November 1980 and June 1981, 32 two-ton samples of conglomerate and 15 thirty-gallon "soil" samples were collected from the Hornbrook Conglomerate gold property and processed.

Gold occurs in a Cretaceous basal conglomerate and also in a large lens roughly 1000 feet stratigraphically above it. The thicker portions of these conglomerates aggregate some 5 lineal miles of surface exposure (see enclosed map).

The property in part consists of a number of square miles of U.S. Forest Service and B.L.M. land on which unpatented mining claims are held by a number of local residents; the rest consists of a total of several square miles of surface and mineral rights owned by individuals and corporations.

This property, 6 miles south of the Oregon state line and 2 miles west of Hornbrook, is favored by its close proximity to a railroad, Interstate 5, commercial power, water, and the towns of Yreka and Medford.

A previous report, dated October 1980, concerned seven very small samples from various parts of the conglomerate but all from above bedrock. It is curious that the average value indicated at $400 per ounce of gold was $8.42, while the average of all the two-ton above-bedrock samples that can be assumed to be representative was little different, at $9.23.

GEOLOGY

Only four days were spent in reconnaissance mapping of the two principal conglomerates. The conglomerate sections were not measured but rather their vertical thicknesses were simply visually estimated. No other geologic work was done, nor was the geologic literature searched. However, several regional maps from the Ph.D. work by Monte Elliott were made available. In addition, a very useful paper by Dr. Elliott, dated December 1980, describing the Cretaceous Hornbrook formation, of which the conglomerates are a part, was also made available.

In general, the Hornbrook formation consists of immature, poorly sorted clastic sediment transported northeastward from a Cretaceous island comprised of Triassic and older metasedimentary rocks, together with Jurassic intrusives. The eroding highlands contained some gold-quartz veins as well as massive sulfide deposits. Instability of the highlands is indicated by unconformities within the sedimentary units, the units' thinning within a few miles, and variations in grain size of sediment among the several formation members.

BASAL CONGLOMERATE

The basal conglomerate originated as river-transported detritus primarily, and from adjacent highlands having considerable relief. However, the conglomerate would have been affected by shore and shallow-water processes during depression of this general area. A variety of very spherical cobbles and small boulders are present in the thicker basal conglomerate north of Rocky Gulch. Some of this

material contains rather coarse sand as matrix material and may represent sediment within the river channel proper. Farther north, the fine-grained matrix may indicate abundant river floodplain sediment, or possibly beach mud-flat deposits containing cobbles rolled during exceptional storms. In any case the southern half of area III, from Rocky Gulch northward to Rancheria Creek, is most likely to contain channel deposits proper.

For nearly a mile south of Rocky Gulch, fine-grained sediments were deposited on a rather flat "bedrock" surface.

South of this, in area IV, the "blue gravel" of strictly local derivation was deposited. The clasts are relatively small and quite angular. Mixed with them are thin interbeds of silt and clay, or "mud." These interbeds may well represent wet sediment flowage. Quite likely this material was derived from erosion of sea cliffs along the shoreline. Such an area on the island would represent a ridge between drainages.

UPPER CONGLOMERATE

The upper conglomerate, of area II, constitutes a large lens containing mainly quite hard wave-worn cobbles, mainly in the form of discs. Most likely this lens is the product of erosion and transport of cobbles from the basal conglomerate. Most cobbles are of quartz or quartzite. The margins of these cobbles indicate an original spherical shape. Oscillation by wave action on a beach produced the very common flattening and also destroyed the softer cobbles. The gradual lateral thinning of this lens, over some miles, requires shore

and shallow water processes to have transported cobbles for several miles laterally, along shore, from any main channel.

CONGLOMERATE MATRIX

There are variations in the matrix material that have a bearing on quantity, coarseness, and flattening of the gold to be expected. In addition, the nature of the matrix would to a large extent determine mining and processing methods--and costs.

Cementing agents are thought to be largely clay and hydrous iron oxides, but some local calcite may be expected. A cursory examination of two thin sections of the upper conglomerate of area II indicates limonite and some clay as cementing agents in what was rather hard conglomerate. The sections also revealed poorly sorted, feldspathic, angular, and very closely packed medium and coarse sand to comprise the matrix. Minor biotite, muscovite, and chlorite flakes are also present. But this is probably not typical of the basal conglomerate matrix.

Possibly some of the basal conglomerate could be ripped rather than drilled and blasted. And most of area III may well be amenable to autogenous grinding.

BULK SAMPLES

The collection and processing of 32 large samples, at a cost of roughly $3500 each, constitutes the first serious effort to determine the gold content of the two principal conglomerates. Approximately two thirds of the samples were of some 30 inches of lowermost

conglomerate together with about 8 inches of bedrock. The other one third of the samples was from various levels above bedrock. Four samples contained quite uncharacteristically high values and should be considered unrepresentative of any tonnage other than of the samples themselves. Since these 32 samples represent some five lineal miles of exposures, the values must only be considered indicative of actual values present. To establish acceptable mining reserves, to an uncertainty of plus and minus 10%, 12-inch holes must be drilled on 200 to 300 foot centers. However, area III may confidently be expected to be the most interesting economically; underground mining of a minimum mining thickness along bedrock will almost certainly never be economically feasible; and there is a possibility, although it is improbable, of a few tens of millions of tons of currently economic conglomerate being present in the south half of area III. In general, the results of this sampling suggest that if a large fraction of the conglomerate were in production at this time, the cost of producing gold would be on the order of $550 to $750 per ounce.

SAMPLE COLLECTION METHODS

A number of roads and four-wheel-drive trails cross the property but it was still necessary to doze about 3 miles of sample-access roads and to improve some of the trails. Blasting was not required, and most of the area is mantled by at least several feet of soil and subsoil. However, an extensive network of drill roads and sites would require some drilling and blasting.

At sample sites at the base of the conglomerates, overlying soil was dozed off to reveal conglomerate, containing undisturbed matrix,

in sharp contact with bedrock. Where necessary, loose material of any kind was removed by hand shoveling before a sample was collected. In a few instances an existing roadcut was widened to reveal a fresh conglomerate-bedrock contact in the roadbed. Samples from above bedrock came from roadcut sites after removal of overburden with either a dozer or a backhoe.

A small backhoe was used to fill six 55-gallon steel drums for each sample. The conglomerate is sufficiently weathered near the surface that blasting was not necessary although it was used for two samples and would have been useful for several others. The drums were then numbered, transported to Henley, and steel covers immediately welded on. These were then shipped in truckload lots to a small processing mill at Williams, Oregon, near Grants Pass, Oregon. This mill is owned by Mr. David Vallandigham of Williams.

SAMPLE PROCESSING METHODS

At the mill the samples were first weighed and the moisture content estimated. The entire milling process was supervised by Mr. C. A. McKinley of Oracle, Arizona. After weighing, the conglomerate was transferred to an ore bin from which it passed through a crusher, then was milled to about 35 mesh, or about 0.3 mm, in a ball mill. The resulting pulp was then passed over a concentrating table, and some 2 to 4 gallons of heavy-mineral concentrate was produced per sample. The entire mill circuit was cleaned and flushed before the first sample and after each succeeding one. Mill tailings were not assayed, but gold recovery was estimated at about 95%.