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TERRITORY OF ALASKA
DEPARTMENT OF MINES

PROPERTY EXAMINATION REPORT

WILLIS CINABAR PROPERTY
SELETNOME DISTRICT, ANIAK PRECINCT
KUSKOKWIM REGION, ALASKA

by

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CONTENTS

	<u>Page</u>
SUMMARY	1
INTRODUCTION	2
LOCATION AND ACCESSIBILITY	2
TOPOGRAPHY	3
TIMBER AND VEGETATION	3
WATER SUPPLY	3
HISTORY AND OWNERSHIP	4
GEOLOGY	4
Results of Past Prospecting and Development	5
Sills	7
Dikes	7
Mineralization	8
Sampling	9
CONCLUSIONS	11
RECOMMENDATIONS	12
APPENDIX	
Map 1. Plan of Claims and Old Workings	
Map 2. Key Map of Region	
Map 3. Copy of U. S. Bureau of Mines Fig. 10	
Pictures of Area	
REFERENCES	
U. S. Bureau of Mines R. I. 4065. Pages 13, 28 & 29	
U. S. Geological Survey Bul. 622. Pages 272 to 280	

REPORT ON
WILLIS CINNABAR PROPERTY
SLEITMUTE QUADRANGLE, KUSKOKWIM REGION
ANILAK PRECINCT, ALASKA

SUMMARY

From examination of the old Willis cinnabar property made in July 1954, it is believed this old prospect is of real interest. This is especially in view of present record high price for quicksilver (currently quoted at \$317.00 to \$320.00 per flask) and the governments guaranteed \$225.00 per flask "floor" price up to 1957.

The mineralization along the northerly striking dike at west limits of the prospected area is presently believed of secondary importance to that found in the sills exposed by the 1954 program of "stripping" by dozer.

Last years work suggests possibility that further stripping may locate a relatively large tonnage of low to medium grade ore in this area of more favorable structural conditions and greater mineralized width.

Old workings along the persistent dike that strikes north were largely caved or sloughed-in, preventing a detailed study of extent and degree of cinnabar concentrations. While past work in this area suggests that the mineralization as a whole is probably too low grade to be of economic interest, there are several points warrant investigation.

One of these is Adit No. 7. Here the dump shows some pieces of good ore in a brecciated argillite. This short tunnel should be cleaned out and checked, as a strong shearing is indicated along bedding of the sediments and a sill may be present nearby.

Another area along this northerly striking dike is vicinity of the No. 2 Adit. The caved portal should be cleaned out and the 200 foot (reported) working examined. On surface, 10 feet to the south, a strong sheared (fault) zone is present carrying encouraging cinnabar mineralization; its strike appears to be along bedding of the sediments.

At the northeast end of the mapped area, the 1910 work of Nick Mellick shows some good values in dumps of Adit No. 8 and the trenched open-cut 30 feet to the north. Both the trench and the adit are following bedding of the sandstone and it is suggested that a nearby sill is responsible for the mineralization.

From present knowledge of the property it is believed that the greater widths of the mineralized sills should be given first consideration, and their lateral extent be determined by dozer stripping. Special effort should be made to expose the hanging-wall shale and argillites as these to date appear to be the most favored "host" rock for cinnabar deposition in the region.

INTRODUCTION

At request of Oswald and George H. Willis an examination was made of their property July 20th to 24th (inclusive), 1954, and additional stripping program was laid out for them.

A Brunton-tape traverse of the area was made, and all old workings and the extensive 1954 dozer stripping completed up to date of visit by George Willis last year were tied-in and mapped. Most of the adit portals were caved and many of the open-cuts and all of the old test-pits were sloughed in.

Following mapping and study of the area and sampling of cinnabar showings in last years stripped section, certain recommendations for additional stripping program during balance of the season, and other work suggested for 1955.

LOCATION AND ACCESSIBILITY

Located in the Sleetmute area, Aniak Precinct, Kuskokwim River Region, the Willis property lies at approximate geographical coordinates Long. 157° 22' and Lat. 61° 49'. *

The property is located on north side of the Kuskokwim River, about 4 miles downstream from the Red Devil Mine, and 2 miles below the old Parks cinnabar prospect. The mouth of Willis Creek is opposite the mouth of Fuller Creek. The showings are on the left limit (east side) of Willis Creek, about 1½ mile from the river. From river bank to the cabin the trail is in fair condition and it is about a 35 minute walk; a half mile of the trail is soft going.

The present tractor trail leaves the river at the old Parks camp, and is reported to traverse firm ground with an easy grade throughout the estimated 6 miles to the Willis property.

The showings lie within limits of 540 to 865 feet above sea level.

The area is accessible via Northern Consolidated Airlines daily from Anchorage to McGrath, thence from there by "float" bush planes on regular schedules two or three times weekly. Flight time Anchorage to McGrath is 1 hour 35 minutes, and McGrath to the Red Devil Mine (Decoursey Mountain Mining Co.) airstrip or mouth of Willis Creek about 1½ hour.

The Red Devil Mine airstrip, about 2 miles upstream from mouth of Willis Creek, was improved and enlarged late last fall and will now accommodate DC-3 planes direct from Anchorage.

Bulk freight shipments from stateside is routed to Bethel. From there it is

*Refer to Map 2

transferred to shallow-draft river boats, supplying all points along the Kuskokwim River as far inland as McGrath. River freighting is limited to period from mid-June to October; exceptional weather conditions have on occasion permitted river navigation continuing into November.

The Kuskokwim Region, long known to contain many mineral deposits, has been retarded in development and handicapped in growth by excessively high freight rates and short transportation seasons on the river. It is a region urgently in need of roads and of highway connections to the rail belt; until that is realized it will continue to be a backward area and unable to properly contribute to growth of the Territory.

TOPOGRAPHY

The area in immediate vicinity of the Willis property is one of low relief. Elevation of the Kuskokwim River at mouth of Willis Creek was taken at 250 feet above sea-level.

The cinnabar occurrences are located on a northeasterly-southwesterly trending low-lying rounded ridge. The west end of the claims - on west side of Willis Creek - are within limits of 400 to 450 feet elevation, while the eastern end on the ridge crest are 680 to 900 feet above sea-level. (Base point datum by Paulin Altimeter).

The wide, gentle slope of the ridge crest from area of 1954 dozer stripped area to the southwest, is suitable for a landing strip.*

TIMBER AND VEGETATION

Only small scattered spruce is to be found on the ridge crest and at higher elevations to the north. However, there is an abundance of spruce along the river suitable for mine timber and lumber.

Small poplar and birch is abundant on the slopes, and birch and cottonwood of good size was noted along trail from the river.

Underbrush growth is not heavy in the area which makes it easy travelling on foot, especially at elevations a few hundred feet above the river level.*

The Kuskokwim Region is noted for its mosquito and fly pestilence, and this district is no exception.

WATER SUPPLY

The water supply is limited to small flow in Willis Creek. There are a number of springs along the ridge slope; the flow from face of No. 6 adit is the largest. However, water requirements for a cinnabar reduction plant are not high, and Willis Creek may be found to carry sufficient volume for operational and domestic needs. If not, the additional supply required could be pumped from the river or the plant located nearer to it.

*Refer to Map I & to attached pictures.

HISTORY AND OWNERSHIP

Mr. O. Willis reports that he and partner . . Fuller made their original discoveries and locations in 1909. This was the year after E. W. Parks made the original "whiteman's" discovery of cinnabar in the area and located the Alice No. 1 and Bessie No. 1 mineral claims. *

(An historical note was added August 19, 1954 by Oswald Willis. He reported that Mr. Parks learned of the cinnabar occurrence through a native on the Tuliwuk River (Itulilik Creek?) in 1905 or early 1906).

Willis & Fuller's locations followed 2 years of tracing the cinnabar mineralization northwesterly from the Parks property by means of many small shallow pits and trenches spaced 150 to 200 feet apart in a "staggered" pattern. Most of these pits and trenches Mr. Willis stated carried small but encouraging amounts of cinnabar on panning. George R. Willis also stated he had found numerous points along his "Cat" trail from Parks old camp-site last year, which showed encouraging prospects; this trail is reported to follow and crosses the formation for several miles between the Parks and Willis prospects.

From 1909 until Mr. Fullers death the partners held the property through performance of annual assessment work. Following loss of his partner O. Willis kept the property in good standing until about 1943, at which time George H. Willis was given an equal interest. Since then the latter has been responsible to large extent for maintaining the property in good standing.

In the 45 years of continuous ownership considerable surface work was done and numerous adits were driven of various lengths. Location of most of this work is shown on Map 1. There are a number of shallow pits and open-cuts which were not observed in running the Brunton-tape traverse; portals of most of the adits and all test-pits mapped were caved, and a number of the old open-cuts and trenches are overgrown with moss and brush.

Fifteen claims are said to have been held for many years; nine of these were dropped a few years ago. Last year the six claims ~~were~~ then being held were re-located and/or amended to conform with recent findings, and cover the presently known structurally interesting and mineralized zones.*

GEOLOGY

The formation on the Willis property, as well as the region as a whole, is composed of thin-bedded sandstones, shales, and some argillites of Cretaceous Age. Sandstones at the southwest and northeast limits of the mapped area, however, are of greater thickness; at these points they appear to have a thickness of possibly 200 and 400 feet respectively. "

Locally, the sediments strike N55 to 85W (magnetic) and dip 50° to 75° south.

* Refer to Map 1.

As elsewhere in the district, the sediments have been intruded by dikes and sills, which have been classed as andesite.* The sills have a definite porphyritic texture.

Government investigations of the district are limited to the following:-

1. Published U. S. Geological Survey reports are confined to references to work done in area by A. G. Maddren in 1914 (Bul. 622, pages 274 to 280). Maddren's investigations were limited to the nearby Parks property, where the geology, structural conditions, mineralization and mineral associations generally resemble those at the Red Devil Mine and the Willis property.
2. In 1942 W. M. Cady and E. J. Webber, U. S. Geological Survey, made a more detailed study of this district. Their work included a study of the Willis property as well as a number of other cinnabar occurrences in the Kuskokwim Region. Unfortunately, their report has not been published to date; recent inquiry at the Anchorage USGS office, however, reveals that it is being published as a Professional Paper which is expected to be made available within the next month or two.

The Cady and Webber report should prove to be the most valuable contribution to date concerning cinnabar occurrences in that Region.

3. In 1943 the U. S. Bureau of Mines made an examination of the Willis property. Their work included a program of trenching and sampling.**

From results of that program it was reported that "That the Willis property is unique in that the andesite occurs only as well developed dikes..... Four dikes containing mineralized zones have been discovered to date. The dikes are roughly parallel, and present exposures indicate an echelon pattern. Their limits have not yet been determined".

Mapping of the area in 1954, which tied-in the old workings (as well as the USBM trenching) and last years dozer stripping, however, definitely indicates that the four dikes "roughly parallel" are faulted blocks of the same northerly striking dike, and are mapped as such.***

George Willis reports that along the same projected strike they have found outcrops of this dike $\frac{1}{2}$ to $\frac{3}{4}$ ^{miles} to the north, with the northern most outcrop on west side and near mouth of Willis Creek's northwesterly tributary.

Results of Past Prospecting and Development

The chronological order in which the earlier work was done is not clear. Prospecting progressed from the ridge crest down the west slope. With location of the dike whose strike is north and dip is steeply to the east, work from then on was confined to large extent to this dike and the intruded

* U. S. Bur. of Mines R. I. 4065. Page 28.

** Map 3. Also USBM R. I. 4065. Page 28

*** Map 3.

sediments for short distances on hanging- and foot-wall of the dike.

The trenching, open-cutting, and adits cross-cutting this dike, revealed it to have been well fractured and faulted at number of points. Fault displacements - with strikes and dips mostly the same as the sediments - appear to have been within limits of 20 to 40 feet. With trenches and open-cuts sloughed-in on foot-wall side of the dike, it was not determined whether appreciable displacement of the ~~sediments~~ sediments occurred along strike of dike prior to or after its intrusion.

The presence of sills in the area was originally (?) suggested in Adit No. 2. Here Mr. O. Willis reports that he followed one wall of a "dike" from point 20 feet from ~~from~~ portal for 180 feet to the face. With the bearing of this adit as shown on Map 1 it is considered ~~as a sill~~ a sill, which is now considered to be the same sill as that exposed in 1954 by dozer cut No. 4-CT.

Other sills are suggested by old work at following points:-

- (a) The dump of Adit No. 7 shows some pieces of ~~of~~ good ore occurring in a brecciated argillite. It is suggested that this short adit lies to east of the dike, and that the brecciation is associated with a nearby sill. The portal is caved, the adit is reported to be 15 feet in length, and its bearing is along strike of the sediments.
- (b) Adit No. 4 appears to have been driven along hanging-wall of the sill uncovered last year in dozer trench No. 6-CT.
- (c) Bearing of Adit No. 5 indicates it may have been driven ~~in~~ entirely in sill exposed in dozer trench No. 7-CT.
- (d) The highly oxidized and weather^{ed} material on bank of south half of contour trench (open-cut) No. 15-OC - 80 and 140 feet west of No. 6-CT and No. 7-CT dozer trenches, respectively - is probably the same intrusive as exposed in one or the other of these dozer trenches. Portals of both Adit No. 4 and Adit No. 5 are caved. The two faults exposed in cut No. 6-CT indicate that sill in No. 7-CT may be same as that in No. 6-CT.
- (e) The work done by Nick Mellick at northeast limit of mapped area in 1910 shows some fairly good ore in Adit No. 8 and open-cut No. 20-OC dumps. Both the adit and the open-cut follow the bedding (strike) of the sandstone. It is believed that the mineralization is associated with a nearby sill (or dike?), although no igneous material was noted in the dumps.

The bedrock area exposed by stripping last season is believed to be the most promising and interesting disclosures found on the property to date.*

* Refer to Map 1.

Sills

In dozer trench No. 4-CT a sill 35 feet in width was exposed for short distance. It is well fractured and mineralized along the fault near west end of the cut. The hanging-wall shale was not sufficiently exposed to determine whether appreciable mineralization is present in it. This cut should be deepened sufficiently to get below the "residual" weathering and the shale-sill hanging-wall contact followed easterly.

The sill in No. 4-CT cut is at present assumed to be a faulted section of the sill O. Willis followed for 180 feet in Adit No. 2; its displacement scales about 50 feet.

The sill exposed in dozer trench No. 6-CT has a width of about 70 feet. It is more highly fractured and mineralized than the sill in No. 4-CT. The fault at west end of No. 6-CT cut shows a displacement of 10 feet. Very strong mineralization was noted across 4.25 feet of the hanging-wall shale. Following recommendations, George Willis later reported that he stripped this hanging-wall shale-sill contact easterly. Excellent vales in the shale are said to have been uncovered by that work for the total distance up to point where the second fault was encountered at east end of this cut; its location is plotted from his description, and as a result its strike and exact position will vary somewhat from that shown. Sufficient work was not done to pick up the mineralized shale and dike on east side of the fault.

In dozer trench No. 7-CT another igneous intrusive was uncovered. A dip taken at west end and south side of this cut suggests it to be a dike, but this 65° north dip may be a local variation and the intrusive may actually be a sill.

Trench No. 7-CT has also been well fractured; in this area two narrow fissures, filled with quartz and appreciable cinnabar have been traced (at intervals) for 120 feet to the southeast. Serpentinization of the intrusives along narrow fractures with some cinnabar was also noted in several cuts.*

Three faults of northerly strike and steep easterly and westerly dips were located in the 1954 stripped area. Their displacements in two cases are much greater than along the faults cutting the northerly trending dike at west end of the area.*

Dikes

A dike 18 to 20 feet in width was exposed in dozer trench No. 9-CT near its northwest end. With a strike of N60 to 70E it cuts the sediments at a 45° angle. "

The intrusives in stripping east of this last above noted trench appear to be dikes. The central section of trench No. 10-CT exposed a dike 30 feet in width, with a N53°E strike and steep dip. It is cut by 3 narrow (up to 6") quartz stringers, which show some cinnabar mineralization.*

* Refer to Map 1.

The dozer trenches No. 11-CT, 12-CT, 13-CT, and 14-CT cross-cuts the same dike, and the latter cuts the sediments at a small angle. This dike strikes N75° to 85°E and dips 47° to 55° north.*

In cut No. 11-CT there is 5.66 feet of good cinnabar mineralization in shale on foot-wall side of the dike. Mineralization of minor importance was also noted in the next two trenches to the east along foot-wall of the dike.*

A minor fault displacement is indicated between cuts No. 12-CT and No. 13-CT; the off-set is within limits of 5 to 10 feet.*

As noted on Map 1 the south sections of a number of last years dozer cuts were filled in during course of extending them to the north and northeast.

Mineralization

Mineral occurrences on the Willis property are similar to those at the Red Devil Mine and reported on the Parks property.

The cinnabar is closely (intimately) associated with stibnite. Frequently the greater the stibnite concentration in an ore-shoot or lense the higher the grade of cinnabar ore. However, this is not necessarily the rule.

The presence of metacinnabarite has been suggested to occur on the Willis property by others**, but has not as yet been definitely identified.

Very minor amounts of pyrite (disseminated grains) are present.

Some quartz and calcite was noted associated with cinnabar and stibnite at a number of points, but neither of these gangue minerals are abundant; they occur most frequently along the short discontinuous fractures in the intrusive as veinlets with some cinnabar and stibnite.

Although cinnabar is found at many points on the Willis property, the most favored sections for finding concentrations of economic value are along the hanging-wall side of the sills and in the immediately overlying sediments. Of these the shales and brecciated argillites to date have proven to be the most productive structures in the district.***

As noted elsewhere in this report the most promising mineralization found on the property to date was exposed last year in the hanging-wall shales and in the sills next to that wall, with lower grade cinnabar across considerable widths in the sill itself.

The U. S. Bureau of Mines 1943 trenching across the dike did not locate any mineralized sections of interest, but did show that the minor cinnabar present favored the dikes hanging-wall side.****

* Map 1 attached.

** U. S. B. M., R. I. 4065, page 29

*** U. S. B. M., R. I. 4065, page 13

**** U. S. B. M., R. I. 4065, page 28. Copy attached as Map 3

Sampling

With one exception the samples taken in August 1954 were limited to the mineralized sections exposed during the dozer stripping program of last year. Description of these are as follows:-

1954 Sampling Results*

No.	Width ft.	Mercury		Location	Description
		%	Lbs/T		
1-W	20.0	nil	nil	1-CT	Floor of out. Dike. No sulfides. Limits of exposed dike. HW covered.
2-W	10.0	0.28	5.6	4#CT	Floor 4 ft E. of fault from FW side weathered porphyry sill. Mineralization limited irreg. SbS-HgS stringers in 16" section.
3-W	9.5	nil	nil	4-CT	Adjoins #2-W on HW side. No sulfides noted. Sill.
4-W	6.0	2.43	48.6	4-CT	Balance of sill to shale HW. 3 ft of sample along x-fracture filled with SbS-HgS. No sulfides noted in HW shale which should be followed & stripped below residual weathered zone.
5-W	4.25	3.75	75.0	6-CT	HW shale adjoining sill, at foot of bank. Requires widening of cut to south and deepening to SE & NW to determine width and length of lense.
6-W	13.5	0.42	8.4	6-CT	6-W to 11-W (incl) cut on diagonal across sill to cut numerous x-fracture irreg. SbS-HgS veinlets & disseminations more or less at right angles.
7-W	8.5	0.31	6.2	6-CT	Sill. Adjoins #6-W
8-W	10.0	0.36	7.2	6-CT	Sill. Adjoins #7-W
9-W	17.0	0.26	5.2	6-CT	Sill. Adjoins #8-W
10-W	8.0	0.44	8.8	6-CT	Sill. Adjoins #9-W
11-W	10.0	tr	tr	6-CT	Sill. Adjoins #10-W. Sill as a whole is oxidized and altered, with the stronger x-fractures serpentized, & the latter carrying good values.
12-W	Grab	1.43	28.6	7-CT	Grab from 15 points in area 15 ft square; number of small, irreg. "blebs" & veinlets of SbS-HgS.
13-W	2.5	nil	nil	7-CT	Several small veinlets at contact. Cuts sediments & sill(?) at slight angle. Talc, little qtz and small amount HgS-SbS visible.

(Continued next page)

* For location of samples refer to Map 1.

1954 Sampling Results

(Continued)

No.	Width ft.	Mercury		Location	Description
		%	Lbs/T		
14-W	9.0	nil	nil	7-CT	Continuation of #13-W to the north. Taken to determine whether the sill(?) carried dissem. values, although no HgS-SbS noted.
15-W	5.66	0.95	19.0	11-CT	Taken across shale & sandstone on FW side of dike. Dike dip here is nearly vertical (80-85N) which is possibly a local variation from a south dip, as HgS concentrations generally lie of HW side.
16-W	2.66	tr	tr	17-CT	Oxidized bedrock section reported to have shown few HgS colors on panning. At west end of out.
17-W	3.00	nil	nil	17-CT	A second oxidized section at center of cut.
18-W	2.5	nil	nil	17-CT	Grab of soft shale and slate bedrock reported to have shown few HgS colors on panning.
19-W	4.0	tr	tr	#6 Adit	Face of adit. Dike, HW side. No HgS noted. Small steady water course flowing into adit from the HW sandstone reported to be washing little HgS into adit.

The above samples were also run for gold-silver as a matter of interest with negative results.

The area as a whole was checked with a Geiger Counter, but no radioactivity was found in the vicinity.

U. S. Bureau of Mines sampling*

Location and results of sampling the trenches excavated along the northerly striking dike by the Bureau in 1943 are shown on Map 3; their location is also plotted on Map 1. These trenches cross-out the dike, and the values encountered are not encouraging.

Their sample intervals are not given, but appear to be uniformly 5 foot widths.

* U. S. Bur. Mines R. I. 4065. Pages 28 & 29.

CONCLUSIONS

The 1954 stripping program has exposed an area of far greater interest than has been found on the property by work done in the previous 45 years of continuous ownership.

Mineralization found in the limited bedrock exposures of cuts No. 4-CT, No. 6-CT, No. 7-CT, and No. 11-CT hold possibilities of locating cinnabar ore-bodies of real economic importance.

The sills offer the best structural conditions for ore deposits of this type. This has been true at the nearby Red Devil Mine, and with cinnabar occurrences elsewhere in the world. The intrusive itself is generally well fractured and may carry appreciable values. However, it has generally been found that the main ore-shoots are found in overlying sediments and/or along the intrusives hanging-wall. Shales and sandstone, as well as argillite (at times) are the most favored host rocks.

This appears to be the case on the Willis property. The best showing is in the hanging-wall shale in cut No. 6-CT. Here a 4.25 foot width had 3.75% mercury and the full width of mineralization had not then been determined. During September, 1954, that stripping easterly from sampled point along the sill-shale contact exposed similar mineralization for 40 or 50 feet to point where a faulted was encountered; sufficient work was not done to pick up this contact zone east of the fault. The sill itself in this cut shows cinnabar values of interest across a horizontal width of 45 to 50 feet.

The cinnabar mineralization associated with the sills in this stripped area warrant systematic stripping continuously along their strike, with special attention given to uncovering the hanging-wall shales sufficiently to determine maximum limits of their mineralized widths and lateral extent.

Faulting present in this area presents a structural problem which stripping will greatly aid in solving.

It is believed that this additional stripping program has an excellent chance of indicating important tonnages of low-grade ore in the sills and high-grade ore-shoots in the hanging-wall sediments, which can be rapidly proven by a diamond drilling program.

There is the possibility, also, that this exploration program may prove-up an area suitable for open-pit mining, especially on west side of ridge.

The pieces of high-grade ore on dumps of Nick Mellicks old workings and on dump of Adit No. 7 are two additional points warranting early investigations.

The old work along the northerly striking dike indicates that zone to be of secondary importance, although it should be given further study at some future date. Examination of the dumps of old cuts, pits, and adits between this dike and the 1954 stripped area will give significant information.

RECOMMENDATIONS

The following exploration program with initial emphasis confined to the 1954 stripped area is recommended:-

1. Systematic and continuous dozer stripping easterly to determine lateral extent and importance of mineralized sills and hanging-wall shales exposed last year. Where faults are encountered they should be followed until displaced segments are located, which latter then should be followed to their limits. It is possible the sills may be found to be "pipes" (sometimes called "chimneys" or "plugs") occurring in a fairly closely spaced "echelon" pattern rather than a continuous sill.

Mapping of formation and sampling of mineralized sections should closely follow the dozers exposure of bedrock. Samples should be taken at 5 foot intervals.

The cinnabar mineralization exposed along south wall of dike in cuts No. 11-CT, No. 12-CT, and No. 13-CT should also be followed out by stripping. In this case it may be found that it occurs along bedding of a "favored" shale and terminates within a short distance from the dike. This appears to have been the case along the dike at west limits of Willis' old workings.

2. With slopes too steep to strip the sills along their northwesterly strike, contour stripping cross-cutting the zone should be done. It is suggested these be spaced at 50 foot intervals.

3. While mineralization exposed in the cuts last year justify a diamond drilling program, a month of intensive stripping across the ridge crest would permit a more intelligent drilling program to be laid out, and it is recommended that it be delayed until that is done.

4. The mineralized zone followed short distance by Nick Mellicks 1910 work showing some good ore in the dumps of adit and nearby open-cut, should be stripped to determine its possible importance.

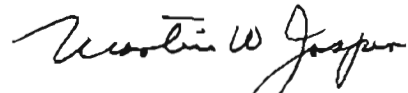
5. The small amount of high-grade cinnabar in brecciated argillite noted on Adit No. 7 dump makes that section one of interest. This working is considered to be on east side of the northerly striking dike, and that a sill may be responsible for the mineralization. It is recommended that some stripping be done there to determine extent and possible economic importance of the occurrence.

6. Dumps of Adits No. 2, No. 4, and No. 5 should be examined and sampled. It may prove desirable to clean out and check these old workings. Dumps of all open-cuts (where caved), trenches, and test-pits (latter all caved), between the dike on the west and stripped area on the east, should be checked for values as a matter of interest.

RECOMMENDATIONS (Continued)

7. The sheared (fault) zone 5 to 8 feet in width, located 10 feet south of Adit No. 8 should be checked. A strong structure whose strike and dip appears to be the same at the sediments, it carries noticeable cinnabar mineralization and warrants investigation as time permits.

8. Although past work along the dike at west limits of the prospected area has not to date located cinnabar concentrations of importance, it warrants more thorough investigation and stripping along its strike at some future date.



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Territorial Department of Mines

Anchorage, Alaska
April 27, 1955

WILLIS CINNABAR PROPERTY



Aug. 21, 1954

View looking S35W (mag) along ridge crest, showing location of 1954 dozer cuts on right (West) side in center background. Kuskokwim River in valley. Taken from point 80 feet East of Adit No. 8.



Aug. 21, 1954

View looking S47E (mag) from ridge crest approx. 500 feet NE of Adit No. 8. Showing low relief of district, and location of mouth of Red Devil Creek and mine in center background, approx. 5 miles distant.

WILLIS CINNABAR PROPERTY



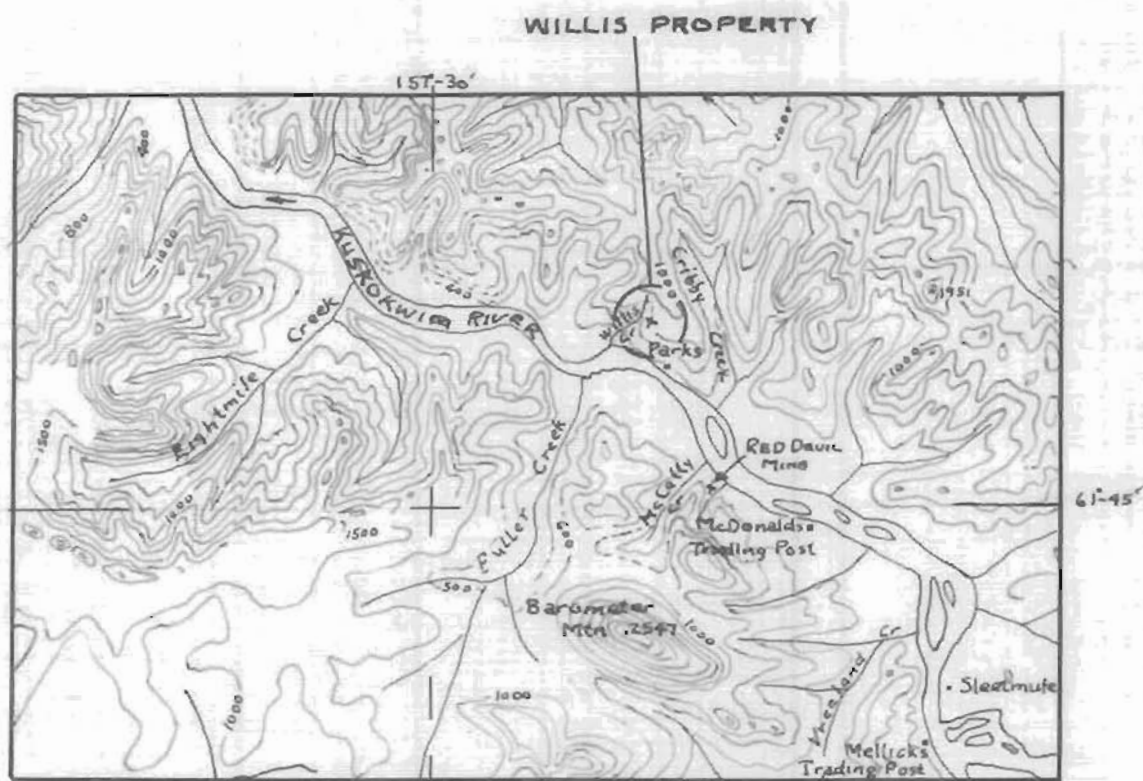
Aug. 21, 1954

View looking S48W (mag) along ridge, showing
some of 1954 dozer cuts in center background.
George N. Willis in foreground.

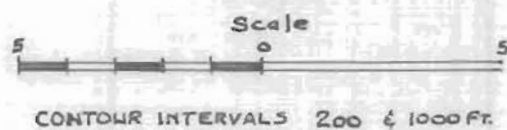


Aug. 21, 1954

View looking S30W (mag) along ridge crest.



KEY MAP OF DISTRICT
TAKEN FROM
SLEATMUTE QUADRANGLE, U.S.G.S.



MAP 2
by
M. W. Jager, Assoc. Min. Eng.
TERRITORIAL DEPARTMENT OF MINES
APRIL 27, 1955 ANCHORAGE

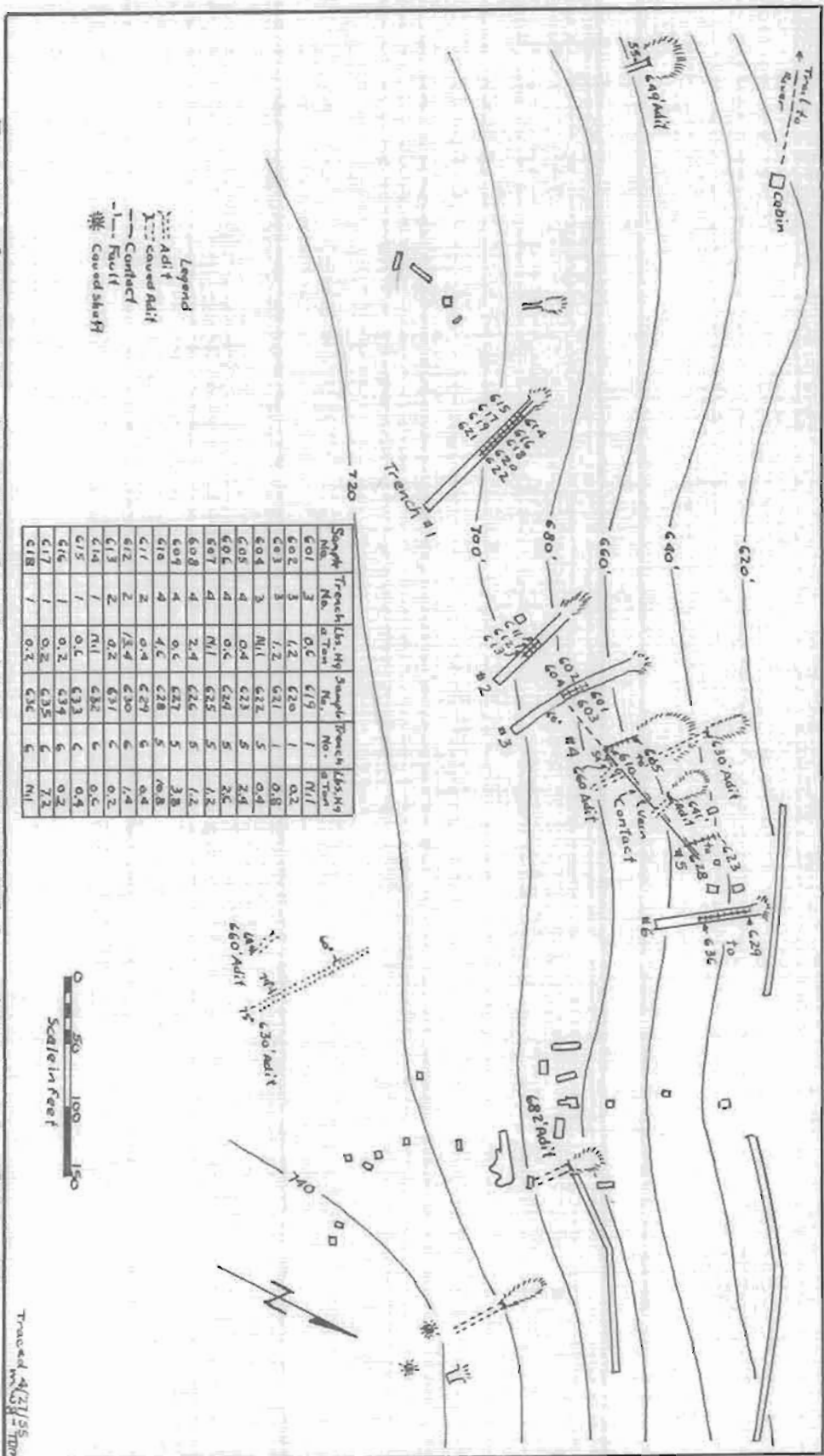


FIG. 10. SAMPLE LOCATIONS AND ANALYSES, WILLIS GROUP

U.S. BUREAU OF MINES R.I. 4065. Page 28

MAP 3