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Spa Mines Limited (N.P.L.)

Summary Report

SIWASH CREEK PROPERTIES
Princeton, British Columbia

J. F. McIntyre, P.Eng.
January 30, 1968

92 H/16

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INTRODUCTION

The Siwash Creek properties of Spa Mines Limited (N.P.L.) are located on and adjacent to Siwash Creek, twenty-three miles north-by-northeast of Princeton, British Columbia, in the Similkameen Mining Division. The writer was engaged as Consulting Engineer by the company during mid-summer of 1966 and on September 30, 1966 reported in detail on the properties recommending extensive exploratory work. Subsequently during the remainder of that year the company explored the properties by bulldozer trenching, sampling and geochemical surveys and a camp was constructed.

During 1967 the company continued with extensive exploratory work on the claims employing diamond drilling and further bulldozer trenching and sampling. All work performed by the company during the 1966 and 1967 seasons was carried out in consultation with and was supervised by the writer. On January 30, 1968 the writer submitted a summary report on the results to date, but omitting much general information related in the September 30, 1966 report. This report includes all information to date and supercedes both previous reports.

Certain claims have been added to or dropped from the groups described in the 1966 report and slight changes in nomenclature have been made. Certain of the northeasterly claims of those previously referred to as the "Dillard claims" have been grouped together under the title "Silver Group" and the prospective mineral zone therein is referred to as the Dillard zone. The Mabel showings in the Siwash claims continue to be known as the Mabel zone.

HISTORY

Considerable prospecting and underground exploration was carried out on Siwash Creek from 1917 to 1929 on various veins occurring from Teepee Creek

north for a distance of about 4 miles. Reports on these various veins are found in the Annual Reports of the Minister of Mines for 1917, 1918, 1925, 1927, 1928 and 1929. A few small shipments of high-grade silver ore were made from some of the properties but none ever reached the stage of a significant producing mine. Most of the veins were worked principally for silver but work was hampered, according to reports, by lack of suitable roads. It would appear that little work was carried out in the area from the economic collapse of 1929 until 1966, since which time much activity has taken place throughout the Trepanege Plateau area.

PROPERTY

The property is comprised of two separate but adjacent groups of mineral claims all held by location, referred to here as the Siwash and Dillard Claims. These are shown on Figure 8.

The Siwash claims comprise a group of 30 full and fractional claims located either side of Siwash Creek at its confluence with Teepee Creek. The block is irregular, roughly 2 miles long along a north-south trend, by 1/2 mile wide. Enclosed by it is a single crown grant which is not included in the company's holdings. The claims in the group are as follows:

Rosso	No.	1	
Fix	"	50-69	inclusive
Fix	"	72-74	"
Duke	"	1 - 4	"
Pet	"	1 - 2	"

The Dillard claims are comprised of 103 full-size claims trending east-west along the west fork of Siwash Creek and the head end of Dillard Creek. The east boundary of the group is roughly 1 mile west of Siwash Creek and 3/4 miles from the westerly boundary of the Siwash claims. The claims included are as follows:

Tent	No.	1-2	inclusive
Al	"	14,16,18	
Al	"	20,22	
Pet	"	3-8	"
Top	"	39-50	"
Top	"	69-88	"
Top	"	100-101	"

Fix	No.	035-036	inclusive
Fix	"	048-057	"
Fix	"	152	
Fix	"	160-163	"
Fix	"	168,170-175	"
Fix	"	178,180-193	"
Fix	"	185A	
Fix	"	319-322	"
Fix	"	331-336	"
Fix	"	345-350	"

The writer has not yet had the opportunity to define or check, on the ground, the precise locations and boundaries of the claims which are roughly shown on Mineral Claim Map No. 92H/16W, British Columbia Department of Mines and Petroleum Resources. However on December 2-3, 1966 the writer inspected various of the claims for staking procedures and concluded that the claims were staked in accordance with the provisions of the Mineral Act of British Columbia.

ACCESS AND TOPOGRAPHY

Access to the property is gained from a well-travelled, gravel road and the Kettle-Valley railroad both of which run from Summerland to Princeton. From the railroad (and road) near Jellicoe the mine is six miles by a fairly good dirt road which could easily be improved to a first class road.

The area of the claims is one of subdued mountains of the Trepanege Plateau. Valleys are at 3500 - 4500' elevation and the mountains rise to 5700'. For the most part the Siwash claims are at 3500 - 4000' while the Dillard claims are mainly at 4000 - 5000'. The entire area is wooded with fir, balsam and spruce which varies from fairly loose along Siwash Creek to very dense on parts of the Dillard Claims.

GEOLOGY

The geology of the area has been mapped by H.M.A. Rice, Geological Survey of Canada, Map No. 888A, Princeton.

The claims are underlain by three distinct groups of igneous rocks. The Siwash claims and easterly half of the Dillard claims are underlain by granodiorite of the Osprey Lake body of the Coast Intrusions of Jurassic (?) age. North of Teepee Creek the granodiorite has been intruded by a stock-like body of granite called the Siwash Creek body, correlated with the Otter Intrusions of Upper Cretaceous (?) age. The westerly half of the Dillard claims is underlain by Volcanic rocks of the Nicola Group of Upper Triassic age. Hence the intrusive sequence was one in which Nicola volcanics were intruded by the Osprey Lake granodiorite and later the Osprey Lake granodiorite was intruded by the Siwash Creek granite. The earlier formations have been severely altered by the successive intrusions and mineralizing solutions have been introduced into all three formations. Some small basic dykes which cut the Osprey Lake granodiorite are probably of Upper Cretaceous age or younger.

In the vicinity of the claims many quartz veins which cut the rocks are mineralized with galena, sphalerite, tetrahedrite, chalcopyrite, pyrite and specularite. These occur at various strikes and dips from one locality to another and mineralization varies widely from one vein to another. No pattern of mineralization is yet evident however the most widely distributed mineral in the area is specularite, which is commonly very fine-grained. All of the veins explored to date carry silver and in some cases very high silver assays have been obtained. The suggestion is that the widespread hydrothermal activity associated with the Siwash granite intrusion and the dykes (contemporaneous or later), introduced much iron, very much higher than usual amounts of silver and moderate amounts of gold, copper, lead and zinc.

Overburden is generally fairly thin on the hills, probably 10' or less in most of the areas seen. In the valley of Siwash Creek some rude remnants of stream sediments were seen which may in places be thicker. For the most part rock outcrops are sparse with the exception of the steeper hillsides sloping into Siwash Creek where outcrops are frequent.

Two important mineralized zones occur in the properties; the Mabel zone in the Siwash claims and the Dillard zone in the Silver group of the Dillard claims. These are described in detail below.

EXPLORATORY WORK

The present operators have carried out extensive work on the properties during the past two years. To date on the Mabel zone and adjacent area over 4,000 feet of bulldozer trenches have been excavated. On the average they were carried to depths of 5 - 10' but in some cases deeper. The diamond drilling program consisted of six holes totalling 2,429'. The core from these was split with one-half sent for assaying and the other half retained at the property. On the Dillard zone over 4,000' of bulldozer trenches were excavated to comparable depths. On both zones, following excavation, the bedrock in the trenches was cleaned off by bulldozer or by hand as required and chip sampled. Sampling was carefully performed by experienced personnel.

Detailed topographic maps were prepared from new airphotos as shown on Figures 1 and 6. Results of surface sampling are shown on Figures 2 and 7. Figures 3,4 and 5 show the drilling results. Much splitting and assaying was done in the less altered rocks however in the interest of clarity of presentation only those assays considered important are shown.

During the 1966 and 1967 seasons much additional exploratory trenching was carried out by the present operators using a bulldozer on claims in the properties other than on the Mabel and Dillard zones.

DESCRIPTION OF MINERAL ZONES

Mabel Zone

The Mabel zone consists of a wide, north-trending, highly altered zone in Coast granodiorite. Principal forms of alteration are chloritization and kaolinization and the degree of either or both varies from slight to intense. In the area explored so far by trenching and drilling the alteration has been demonstrated to occur over widths of up to 300' however the boundaries of the zone have not yet been delimited and the full extent is not known.

The altered zone has been mineralized with specularite, pyrite, chalcopyrite, galena, tetrahedrite

and sphalerite. Values in copper, lead and zinc are quite variable and generally low. Silver occurs in low amounts throughout the altered zone. In parts of the zone it occurs in quite significant amounts including a fair measure of quite high-grade values. Gold values are generally low but again high-grade values occur in some places. The best values occur in the most highly chloritized rocks which form a sub-zone within the altered zone. There appear to be four such sub-zones in the area explored to date of which one exhibits good continuity and favourable grade and constitutes the prime exploration target at this time.

Beyond the highly altered sub-zones the balance of the rocks within the altered zone contain some metal values however the grade appears too low to be of economic importance. In addition to the silver values distributed along the prime north-trending sub-zone there are narrow, west-trending veins containing much calcite which also contain quite high silver values in places.

The geological information and sampling carried out to date on the Siwash zone are shown on Figures 2,3 4 and 5.

Dillard Zone

The Dillard zone was found late in 1966 by a soil geochemical survey which showed anomalous amounts of total heavy metals. Subsequent bulldozer trenching at that time revealed a highly altered, rusty gossan beneath the overburden and during 1967 a series of bulldozer trenches were excavated to expose the zone for sampling.

The trenching revealed a large area of intensely altered rocks of uncertain origin but which are thought to be part of the Siwash Creek body, a stock of younger granite intruded into the Coast granodiorite. The trenching done to date has exposed the altered rock throughout the area tested except for small exposures of unaltered granite at the west ends of some of the trenches.

The altered rock appears to be a bleached, fairly fine-grained, granite containing much pyrite and values in silver and zinc. For the most part where exposed in the trenches the rock is highly kaolinized and most of the sulphide minerals have been leached out by surface weathering. In places the rock is clayey and white, in other places it is very rusty and in others it is a rusty or white rock of high porosity resulting from the dissolving-out of pyrite and other sulphides. In places in the trenches the altered rock is overlain by thin, flat lenses of overburden consolidated by iron oxides

into a rock too hard to be excavated with the bulldozer. In other places in the overburden there are small pockets containing much black manganese.

Where the altered rock was exposed in the trenches it was sampled and assayed for silver and zinc, and in some samples also for gold. Low values in both silver and zinc were found to occur rather uniformly throughout the altered rock wherever it was exposed. Fresh sulphides were found at only a small number of places and it is apparent that the trenching to date, while carried as deep as practical, has not reached below the surface-weathered part of the zone.

The results of the sampling on the Dillard zone are shown on Figure 7.

CONCLUSIONS AND RECOMMENDATIONS

Mabel Zone

To date extensive exploratory work has been carried out. The geology and distribution of metal values is complex however at this stage a much clearer understanding is possible than at the time of the writer's earliest report. Throughout the wide altered zone silver values and some values in gold, copper, lead and zinc occur. However it is now evident that in the limited length of the altered zone explored to date the overall values are too low to make economic grade over the full width of the altered zone.

In the sub-zone lying immediately in front of the adit, values of economic importance have been found. Here a relatively narrower, near vertical zone has been outlined both on surface and in the drill holes. It shows good continuity where explored, viz., along a length of 350' on the surface and to a depth of 400' at Section 50. Beyond these limits it has not been explored and indications are that it should continue further along strike at both ends and to depth beyond the lowest drill intersection. Within the limits explored to date it strikes N 10° E and dips 85° E. The width varies from 5' to over 20' but on the whole averages about 12'.

The grade varies within fairly wide limits and in places high silver values of 10 to 25 oz. were

obtained in individual samples and some gold values as high as 0.16 to 0.43 oz. were obtained. These high assays appear to occur principally where transverse calcite veins cut the highly altered sub-zone either side of the short adit on Section 50 and it is difficult to estimate their importance at this time. Over most of the sub-zone explored so far, excepting near the adit, the grade varies between limits of 2 - 10 oz. silver, 0.2 - 1.0% copper, 0.5 - 1.0% lead and zinc combined and 0.005 - 0.015 oz. gold. It is difficult to strike an average grade at this time however it would appear to be about 5 oz. silver, 0.5% copper, 1% lead and zinc combined, and 0.01 oz. gold. As such, in view of the widths and ground conditions involved, this would appear to be a marginal grade at this time for the length of the zone explored to date.

It is the writer's opinion that the results so far, particularly as applies to the grade of the ore, are somewhat inconclusive. Detailed mapping and sampling of the transverse calcite veins will be required in order to assess their significance and importance. In light of the high silver values found in these veins over widths of 1' to 4' the possibility arises that these structures might by themselves constitute economic zones transverse to the main altered zone. The work carried out so far has been directed to exploring the main north-trending altered zone as a unit rather than to exploring the transverse calcite veins as ore structures in themselves.

The wide, north-trending altered zone and its main sub-zone have to date been explored over a length of only some 400'. The trenches excavated beyond these limits were carried as deep as practical but failed to reach bedrock. It is the writer's conclusion that this zone definitely should be further explored along strike at both ends in the expectation that higher grade and greater widths may be found. Results to date certainly in no way preclude these possibilities nor the possibility that economic values could occur, along strike, over sufficient widths of the altered zone to permit some open-pit mining.

Further exploration should commence with additional trenches along strike in both directions and a series of Induced Polarization lines at intervals of 100' along strike with the view of isolating the better values and projecting the mineralized zone along strike to guide further bulldozer trenching. Following completion of some of this surface work additional drilling can

be better directed. Estimated costs of the next stage are as follows:

I.P. Survey	$10,000
Bulldozer trenching	20,000
Drilling	30,000
Engineering, geological mapping and sampling	10,000
Camp and overhead	15,000
Total	$85,000

Dillard Zone

The exploratory work carried out on the Dillard zone indicates the nature and mineralization of the zone however the ultimate boundaries are not yet known. There is fresh granite showing at the west ends of several of the trenches indicating roughly a limit of the zone in that direction. There is as yet no indication of limitation in any of the other three directions. Virtually the entire area of the closely-spaced, parallel trenches appears to be underlain by essentially the same, highly-altered, mineralized rock. This area is about 600' x 700' in size and the ultimate size will certainly be much greater.

Surface weathering has caused very extensive leaching of the sulphides from the rock near the surface. The bulldozer trenching was carried as deep as was practical yet only a very slight amount of rock with fresh sulphides (principally pyrite) was exposed. The evidence obtained so far indicates that the altered rock below the surface weathering contains very much pyrite and as yet undetermined values in silver and zinc. In the surface-weathered zone the rock contains, rather uniformly throughout the area trenched, 0.1 - 0.3 oz silver and 0.1 - 0.3% zinc, with a couple of assays going as high as 1.5 oz. silver in Trench 100-3. It is not possible to offer any estimate of what the metal grade would be at depth below the weathered surface zone, however it might be expected to exceed the surface grade by a considerable amount. Hence the possibility of a large, relatively low-grade open-pit mining situation is indicated. Some indications of copper have been seen and it is possible that significant amounts might occur at depth. The possibility of such copper occuring in the form of enargite should be kept in mind.

In the writer's opinion this is a most interesting zone. It should definitely be tested by percussion

drilling to determine the grade at depth, possibly down to 200 - 300' initially. Also the existing trenches should be extended at both ends and additional trenches should be excavated parallel to these. This would expand the known limits and ultimately define the boundaries of the altered and mineralized zone. In addition the trenched area and immediate vicinity should be tested by an Induced Polarization survey. Estimates of the cost of this work are as follows:

I.P. Survey	$10,000
Percussion drilling	20,000
Bulldozer trenching	20,000
Engineering, geological mapping and sampling	10,000
Camp and overhead	10,000
Total	$70,000

It is the writer's conclusion that the results obtained so far on both the Mabel and Dillard zones are definitely encouraging and that further exploratory work involving the expenditures shown above is certainly justified. These recommendations constitute only an additional stage of exploration which, it is anticipated, will have to be followed up by more extensive programs. However it is the writer's opinion that recommendations beyond those made herein can be more logically advanced after this work is completed than at the present time.

Respectfully submitted,

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CERTIFICATE

I, J.F. McIntyre, P.Eng., hereby declare that:

1. I hold the degree of Bachelor of Science in Mining Engineering, University of Alberta, 1949; and,

2. I am a registered member, in good standing, of the Association of Professional Engineers of British Columbia; and,

3. I carry on consulting mining engineering practice with offices at Suite 408, 475 Howe Street, Vancouver 1, British Columbia; and,

4. I have practiced my profession continuously since 1949 with wide experience in mining and geophysics; and,

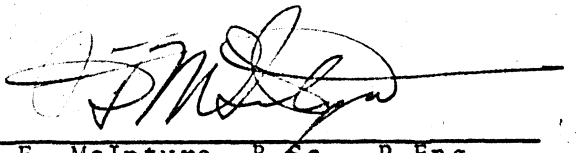
5. I personally examined the property frequently, and personally supervised the exploratory work carried out during 1966 and 1967; and,

6. I have derived my descriptions and conclusions from my personal examinations; and,

7. I have never, do not now, nor expect to receive any interest whatever, direct or indirect, in the securities or properties of Spa Mines Limited or the principals thereof; and,

8. My sole remuneration for this report is the professional fee charged for it.

Respectfully submitted,



J.F. McIntyre, B.Sc., P.Eng.

June 1, 1968