State Department of Geology and Mineral Industries

702 Woodlark Building
Portland, Oregon

SHEEP MOUNTAIN GROUP (Manganese)
Lower Burnt River Area Baker County

OWNERS: John Arthur, Ed Hendryx, Hal Bradley, and James G. Kidwell, all of Baker, Oregon

LOCATION & AREA: Two unpatented claims, located 8 miles west of Durkee and 1½ miles from Burnt River in Section 33, T. 11 S., R. 42 E., and Sections 4 and 5, T. 12 S., R 42 E., W.M.

GENERAL DESCRIPTION: The claims lie on Sheep Mountain, elevation 5,325 feet, which rises 2300 feet above Burnt River. The slopes are steep and uniform and are covered with a sparse growth of sage brush and grass. Snow fall is about 2 feet. The property is accessible in dry weather by a 5 mile poor road that runs up Cave Creek. No equipment is on the property.

GEOLOGY: An undeveloped lode containing manganese crops on Sheep Mountain. This cropping is not prominent. The zone containing the manganese, which dips almost vertically, strikes N 70° E on the west side of Sheep Mountain, N 50° E near the summit and N 60° E on the east side, and dips 80° to the south. It varies from 2 to 4 feet in width and can be traced for approximately a mile, although the principal showing is confined to 400 feet on the southwest side of the mountain. The ore occurs in small lenses and pods of hard black manganese oxided and intermixed siliceous material in a country rock of fine-grained schist. The ore lenses are roughly aligned with the schistose structure. Ore minerals observed were manganite, wad and pyrolusite.

No work has been done on the claims recently. The claims were located by John Arthur about 1918 and sold to a man named Quinn. After the World War No. I, the claims were abandoned and were again relocated by John Arthur and associates in 1939.

All of the development work is open. Analysis of samples taken on the property May 16, 1942, and a sketch of the exploration work is attached.

According to Gilluly, "Geology and Mineral Resources of the Baker Quadrangle" (U.S.G.S. Bul. 879, pg. 113), an undeveloped lode showing considerable manganese at the surface crops out in the claims located by John Arthur and others near the summit of Sheep Mountain, 7 miles west of Durkee. Sheep Mountain is a massive rounded knob on the ridge south of Burnt River that reaches an altitude of 5,325 feet, or about 2,300 feet above the stream. The prevailing rock is schistose argillite, presumably to be correlated with the argillite at Pleasant Valley. The outcrop, which is not conspicuous, ranges from 2 to 10 feet in width and extends from a point near the summit S 50 W at least 4,000 feet down the slope. It consists chiefly of siliceous argillite traversed by small quartz veins, the whole

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GEOLOGY (contd): fractured and partly replaced by manganese oxides. Irregular masses of manganiferous material as much as 3 feet wide and 6 feet long appear here and there. These are composed of streaks, nodules, and irregular bodies of psilomelane, pyrolusite, manganite, and wad bound together with a lattice of quartz seams. The body is cavernous, and the quartzose portions show some flattened cavities whose forms suggest they were molded around crystals of a carbonate such as calcite or rhodochrosite. An average sample of the material selected in mining is reported to carry 27.62 percent of manganese and 42.48 percent of silica. Possibly it can be beneficiated by ordinary methods of concentration. According to Mr. Arthur, a panning test yielded a concentrate containing 39.68 percent of manganese, 24.60 percent of silica, and 0.052 percent of phosphorus. A small amount of ore is found that runs as much as 48 percent of manganese, with 8 percent or less of silica.

The general features of this deposit suggest that it is to be classified with the metalliferous quartz lodes that are abundant in the surrounding region and like them was probably formed by solutions ascending from some cooling, deeply buried igneous rock.

Hugh K. Lancaster

Hugh K. Lancaster,
Field Engineer

June 13, 1942.

State Department of Geology and Mineral Industries

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SHEEP MOUNTAIN GROUP (Manganese)

Lower Burnt River Area Baker County

Description of Samples taken on May 16, 1942.
Locations shown on accompanying sketch.

Sample Number	Description	Percent Manganese
1. (CBF 25)	Sample taken in face of lower tunnel. 45 inches manganese oxide, gouge, quartz and schist.	35.2
2. (CBF 26)	Sample 40 feet from portal of lower tunnel. Width 57 inches (28 inches quartz and schist and 29 inches manganese oxide, gouge, and minor amounts of quartz.	10.2
3. (CBF 27)	Sample 35 feet from portal of lower tunnel. Width 61 inches (45 inches manganese oxide, gouge and minor amounts of quartz and 16 inches quartz and schist.)	32.6
4. (CBF 28)	Sample 30 feet from portal of lower tunnel. Width 60 inches manganese oxide, gouge and quartz.)	36.7
5. (CBF 29)	Sample 25 feet from portal of lower tunnel 51 inches manganese oxide, gouge and quartz.	34.2
6. (CBF 30)	Sample 20 feet from portal of lower tunnel. Width 58 inches (28 inches manganese oxide and 30 inches of schist.)	12.3
7. (CBF 31)	Sample 15 feet from portal of lower tunnel. Width 51 inches (28 inches manganese oxide and quartz and 23 inches schist.)	22.1
8. (CBF 32)	Sample 10 feet from portal of lower tunnel. Width 44 inches (32 inches manganese oxide and schist and 12 inches schist.)	26.9
9. (CBF 33)	Sample 5 feet from portal of lower tunnel. 17 inches manganese oxide and schist.	12.8
10. (CBF 34)	Sample taken in upper tunnel 47 feet from portal. 18 inches manganese oxide and quartz.	18.9
11. (CBF 35)	Chip sample from ore piled at portal of upper tunnel. Chiefly manganese oxide.	20.8
12. (CBF 36)	Sample from first cut above upper tunnel. Width 63 inches (10 inches schist and 53 inches of manganese oxide and schist.)	13.7

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Page 2. Description of Samples taken on May 16, 1942. Sheep Mt. Group.

12a.	(CBF 37)	Chip sample from ore piled on dump at first cut above upper tunnel. Manganese oxide and schist.	17.8
13.	(CBF 38)	Second cut above upper tunnel. 19 inches quartz, manganese oxide and quartz in center of cut.	11.5
14.	(CBF 39)	Third cut above upper tunnel. 47 inches of schist and manganese oxide.	13.6
15.	(CBF 40)	Fourth cut above upper tunnel. 20 inches schist and manganese oxide in side of cut.	20.8
16.	(CBF 41)	Cut on northeast slope of Sheep Mountain 17 inches silicified schist and manganese oxide in center of cut	9.4

COPY

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The attached sketch of Sheep Mountain Manganese quartz Mining Claims No. 1 and No. 2, which are situated about 8 miles west from Durkee, Oregon, and about 1½ miles South from the new highway up Burnt River on Sheep Mountain, Baker County, Oregon, is simply to give a general idea of the workings.

FURTHER DETAILS:

The claims are owned by John Arthur, Ed Hendryx, Hal Bradley, and James G. Kidwell of Baker, Oregon.

The Manganese ore occurs in apparent veins in lime shales, and dip to the Southeast 75° to 85°.

Surface outcrops and ore laying on the surface indicate a very long ore strata or stratas. From tunnel No. 4, the surface indicated the length for ore expectation would be over 2000 feet.

As all work to date was done on the more siliceous outcrops, which are harder than the soft higher grade pyrolusite and which would not outcrop, there are good chances, therefore, of opening important higher grade ore bodies than those exposed under the harder ore.

As the country rock surrounding the ore is a soft shale, a bulldozer would make roads very rapidly.

No systematic sampling has been done by myself, but a former party who did some work, reported 3 to 6 feet of ore assaying 20% to 58% manganese.

The proper way to expose the vein would be to cut deep trenches with a bulldozer across the vein every 100 feet on its strike, as well as other places looking favorable. It is my impression that in fifteen days much ore could be exposed if the bulldozer was used.

/s/ John Arthur

State Department of Geology and Mineral Industries

702 Woodlark Building
Portland 5, Oregon

SHEEP MOUNTAIN MANGANESE PROPERTY

Lower Burnt River District
Baker County

Section 33, T. 11 S., R. 42 E.
Secs. 4-5, T. 12 S., R. 42 E.

Foreword: This report is supplement No. 1 to a Dogami file report under the name Sheep Mountain Group, by H. K. Lancaster, June 13, 1942.

During the years following the issuance of the Lancaster report, this property was held by a succession of several different owners. Although is was repeatedly offered for sale and examined many times by various company engineers, and by personnel of both the U.S.G.S. and the U.S.B.M., the only known report subsequent to Lancaster's report is one on the "Concentration of Oxide Manganese Ore from the Sheep Mountain Property, Durkee District, Oregon," published by the United States Bureau of Mines, Report of Investigations 4149, November 1947. For that matter no significant amount of new development work was done on the occurrence proper excepting that done by the current owners and present lessees as is summarized in the following paragraphs.

Operator & lessees: Paul Wise, P. O. Box 267, Boise, Idaho and Roy Myers, 2604 Sunset Street, Boise, Idaho. Field Superintendent, G. E. Dawson.

Owners: George Bailey, 2432 11th Street, Baker, Oregon.
W. A. Jefferson, 3595 Broadway, Baker, Oregon.

Development: Work was done on the orebody by the owners during the summer of 1951. This consisted of about 50 feet of drift on the No. 1

tunnel pictured on the Lancaster map. Mineralization comparable to that described in the Lancaster report was demonstrated to continue consistently throughout the new stretch of ground. It was essentially full drift width at the face. Backs at this point of penetration are, however, still relatively small so that much additional development will be needed to prove the existence of any great tonnage of ore.

Activity on the part of the present lessees started in the spring of 1952. This consisted of the construction of some 2 3/4 miles of new access road, a 70 ton bunker on the property and a loading dock at Durkee. Track was being laid at the time of the writer's visit, and exploratory development was scheduled for commencement in the near future. A portable compressor has been provided for this and two miners have been employed on a contract basis.

* * * * * * * * * *

Report by: N. S. Wagner
Date of exam: June 9, 1952
Date of report: June 23, 1952
Informants: George Bailey and G. E. Dawson.

R. I. 4149,
November 1947.

REPORT OF INVESTIGATIONS

UNITED STATES DEPARTMENT OF THE INTERIOR - BUREAU OF MINES

CONCENTRATION OF OXIDE MANGANESE ORE FROM SHEEP MOUNTAIN PROPERTY, DURKEE DISTRICT, OREG.[1]

By R. R. Wells[2] and W. W. Agey[2]

CONTENTS

INTRODUCTION

Oxide manganese ore from the Sheep Mountain property was of intermediate grade (23.0 percent manganese) and contained silica as the major impurity. The deposit from which the ore was taken is known as the Sheep Mountain manganese property and is 8 miles west of Durkee, Oreg. Test work was done in the metallurgical laboratories of the Bureau of Mines at Salt Lake City, Utah, on representative samples cut from a 290-pound shipment of crushed ore submitted by the Oregon State Department of Geology and Mineral Industries and reported to be typical of the Sheep Mountain deposit.

1/ The Bureau of Mines will welcome reprinting of this paper, provided the following footnote acknowledgment is made: "Reprinted from Bureau of Mines Report of Investigations 4149."

2/ Metallurgist, Bureau of Mines, Salt Lake City Division, Metallurgical Branch, Salt Lake City, Utah.

ACKNOWLEDGMENTS

The authors wish to acknowledge the assistance of R. S. Dean, former assistant director of the Bureau of Mines, under whose supervision the manganese program was initiated in 1940, and the valuable suggestions made to them by S. R. Zimmerley, now chief, Salt Lake City Division, Metallurgical Branch. Acknowledgment also is made to H. G. Poole and C. H. Schack for their suggestions and contributions to the organization and prosecution of the work of the Ore Dressing Section. Microscopic work on the ores and many ore-dressing products was done by L. G. Evans and the late R. E. Head. Our appreciation is extended also to H. E. Peterson, chief chemist, and members of the analytical staff for the many analyses made of the ores and ore-dressing products.

MANGANESE MARKETING SPECIFICATIONS

At the beginning of the investigation of manganese-ore beneficiation in December 1940, the only product marketable to Metals Reserve Company was ferrograde manganese, grade B, the requirements for which follow: Mn, min., 48 percent; Fe, max., 7 percent; SiO_2, max., 10 percent; P, max., 0.18 percent; Al_2O_3, max., 6 percent; Zn, max., 1 percent.

Later the specifications were modified gradually. As of May 15, 1943, manganese products were acceptable if they contained over 35 percent manganese and less than 3 percent zinc and 1 percent phosphorus. Prices were based upon material containing 48 percent manganese, 6.0 percent iron, and 11 percent silica plus alumina. Premiums were paid for manganese content in excess of 48 percent and iron content below 6 percent, penalties being imposed upon products containing less than 48 percent manganese or more than 6 percent iron or more than 11 percent silica plus alumina. The specifications for commercial manganese further required that maximum particle size be 12 inches and that 75 percent of the product be coarser than 20-mesh. Therefore, fine material, such as table and flotation concentrates, had to be nodulized or sintered. In addition, carbonate manganese ores were not acceptable unless calcined.

After the close of World War II, the Metals Reserve Company ceased purchasing manganese ores and concentrates. Therefore, the specifications given here, although correct at the time of the laboratory investigations, are no longer in effect.

THE ORE

Physical Nature

Microscopic examination showed that the manganese content of this ore was represented by several of the oxide minerals of manganese, chiefly psilomelane and pyrolusite. The major impurity was silica, which occurred rather intimately associated with the manganese oxides. However, it was indicated that a portion of the ore consisted of relatively barren gangue, which could be liberated from the manganese minerals at coarse sizes.

Chemical Nature

Chemical analysis of the ore from the Sheep Mountain property is given in table 1.

TABLE 1. - Analysis of ore

Assay, percent												
Mn	Insol.	SiO_2	Fe	CaO	S	Al_2O_3	MgO	Zn	Co	P	WO_3	Ba
23.0	54.8	49.0	1.6	1.2	Nil	3.8	0.10	Tr	0.01	0.042	Nil	Nil

Distribution of Manganese and Silica

A sample of ore as received was screen-sized wet without further crushing. Distribution of the manganese and silica is shown in table 2.

TABLE 2. - Distribution of manganese and silica

Product	Weight, percent	Metallurgical data			
		Assay, percent		Distribution, percent	
		Mn	SiO_2	Mn	SiO_2
+3-mesh	21.7	25.0	40.0	21.3	21.5
-3+6-mesh	27.9	28.8	39.2	31.5	27.0
-6+10-mesh	14.6	26.6	39.2	15.3	14.2
-10+20-mesh	12.7	27.8	41.4	13.9	13.1
-20+35-mesh	6.3	28.0	38.2	7.0	6.0
-35+48-mesh	2.2	27.0	36.6	2.3	2.0
-48+65-mesh	1.9	25.6	39.0	1.9	1.8
-65+100-mesh	1.5	24.0	42.8	1.4	1.6
-100+200-mesh	2.2	21.6	43.0	1.9	2.3
-200-mesh sand	4.2	12.8	50.6	2.1	5.2
-200-mesh slime	4.8	7.7	44.0	1.4	5.3
Calculated head	100.0	25.5	40.4	100.0	100.0

Table 2 shows that very little of the manganese is contained in the slime and that distribution of silica follows closely that of manganese in all sizes above 200-mesh.

METHODS OF CONCENTRATION

The foregoing data indicated that a portion of the gangue could be rejected at coarse sizes but that a concentrate low in silica would be difficult to produce because of the close association of silica and manganese minerals.

The following methods were investigated as means of concentrating the Sheep Mountain ore: (1) Jigging and tabling, (2) jigging and tabling with re-treatment of middlings, (3) tabling of sized feed, (4) flotation of manganese, and (5) flotation of silica.

Details of the ore-dressing methods employed follow under various headings.

Jigging and Tabling

A sample of the ore was crushed to minus 3/8-inch and sized on 6-mesh, 10-mesh, 20-mesh, 48-mesh, and 100-mesh screens. The minus 100-mesh fraction was deslimed by decantation. Each of the three coarser fractions was jigged separately in a laboratory hydraulic jig to make a concentrate, middling, and tailing. The finer sand fractions were tabled separately to produce a concentrate, middling, and tailing.

Corresponding products from jigging and tabling were combined for assay. Results of this test are summarized in table 3.

TABLE 3. - Jigging and tabling

Product	Weight, percent	Metallurgical data		
		Assay, percent		Distribution, percent
		Mn	SiO_2	Mn
Jig concentrate	31.9	42.3	19.6	58.5
Table concentrate	6.4	41.1	21.2	11.4
Jig middling	11.4	14.7	64.6	7.3
Table middling	10.6	18.3	55.1	8.4
Jig tailing	23.2	7.9	73.0	8.0
Table tailing	10.7	9.9	67.2	4.6
Slime	5.8	7.2	49.6	1.8
Calculated head	100.0	23.1	47.8	100.0
Combined jig and table concentrates	38.3	42.1	19.9	69.9
Combined concentrates and jig middling	49.7	35.8	30.1	77.2

Results given in table 3 show that the combined gravity concentrates contained 69.9 percent of the manganese at 42.1 percent Mn grade. Addition of jig middling raised the recovery of manganese to 77.2 percent in a product that assayed 35.8 percent Mn. As the products contained only 13 and 17 percent of minus 20-mesh material, respectively, they could be marketed directly without sintering under Metals Reserve Company specifications for plus 35 percent manganese ore.

Jigging and Tabling with Re-treatment of Middlings

An attempt was made to increase the recovery and grade by re-treating the middling products of a jig-table test. A sample of the ore was crushed to minus 3-mesh and screen-sized on 6-mesh, 10-mesh, 20-mesh, 35-mesh, 48-mesh, 65-mesh, 100-mesh, and 200-mesh. The minus 200-mesh fraction was deslimed by decantation.

The minus 3- plus 6-mesh fraction was jigged in a laboratory hydraulic jig and a concentrate removed; the remainder of this fraction was crushed to minus 6-mesh and added to the next finer fraction, and this procedure was repeated for the next two fractions. The remaining sand fractions were tabled to make a concentrate, middling, and tailing, the middling being re-treated as described above.

The results of this test are shown in table 4 together with the results obtained by sintering combined test products.

TABLE 4. - Jigging and tabling with middling re-treatment

Product	Weight, percent	Metallurgical data	
		Assay, percent Mn	Distribution, percent Mn
Jig concentrates (to sinter 1)	34.1	42.8	57.0
Table concentrates	15.3	39.9	24.0
Tailings	37.7	9.3	13.7
Slime	12.9	10.4	5.3
Calculated head	100.0	25.5	100.0
Combined concentrates (to sinter 2) .	49.4	41.9	81.0

Results of sintering

Sinter product	Assay, percent						
	Mn	Fe	SiO_2	P	Al_2O_3	Zn	$SiO_2+Al_2O_3$
Sinter 1	47.4	2.0	22.0	0.022	2.1	0.25	24.1
Sinter 2	46.7	1.9	23.4	.023	2.2	.25	25.6
MRC base price marketing specifications	48.0	6.0	-	Max. 1.0	-	Max. 3.0	11.0
MRC minimum marketing specifications	Min. 35.0	-	-	Max. 1.0	-	Max. 3.0	-

Table 4 shows that a recovery of 57.0 percent of the manganese at a grade of 42.8 percent Mn was obtained in combined jig concentrates. This product, being all plus 20-mesh, could be marketed directly without sintering under Metals Reserve Company specifications. By adding the combined table concentrates, recovery was raised to 81.0 percent at a grade of 41.9 percent manganese. The combined concentrate, when sintered, assayed 46.7 percent Mn. Since the total product contained 31 percent minus 20-mesh material, sintering would be required to meet Metals Reserve Company physical specifications for manganese ore.

Tabling Sized Feed

To determine whether high-grade concentrates could be produced by finer grinding before gravity treatment, a table test was run on ore that had been stage-ground to minus 48-mesh, deslimed, and the sands screen-sized into three fractions. A recovery of 73.8 percent of the manganese was

obtained in a combined product that assayed 38.0 percent Mn and 27.2 percent SiO_2. As the results were inferior to the jig-table tests previously described, details of the test are not included in this report. It was concluded that after the relatively coarse barren portion of the gangue is rejected, further liberation of silica from manganese oxides would involve excessively fine grinding.

Flotation of Manganese

Preliminary tests were run on deslimed and undeslimed ore at various screen sizes in attempts to separate manganese from gangue by flotation. Only the test giving the best results is described in detail.

A sample of minus 10-mesh ore was stage-ground to minus 65-mesh and deslimed by decantation. A rougher manganese concentrate was floated and subsequently cleaned to make two cleaner concentrates, a cleaner tailing, and a rougher tailing. The slimes, being low in manganese tenor, were not treated. Flotation was carried out in a mechanically agitated laboratory cell with Salt Lake City tap water. Sodium silicate and sulfuric acid were used as conditioners, and a water emulsion of oleic acid stabilized with Emulsol X-1 was used as frother-collector.

Test data are summarized in table 5.

TABLE 5. - Flotation of manganese

Product	Weight, percent	Metallurgical data		
		Assay, percent		Distribution, percent
		Mn	SiO_2	Mn
Cleaner concentrate No. 1	24.8	42.4	18.4	44.1
Cleaner concentrate No. 2	7.8	37.0	27.6	12.0
Cleaner tailing	21.5	18.8	55.2	16.9
Rougher tailing	31.8	13.4	67.8	17.9
Slime	14.1	15.2	44.6	9.1
Calculated head	100.0	23.8	43.2	100.0
Combined cleaner concentrate	32.6	41.1	20.6	56.1

Reagent consumption

Operation	pH	Reagents, pounds per ton of ore			
		Sodium silicate	Sulfuric acid	Oleic acid	Emulsol X-1
Rougher	6.8	4.5	3.2	1.6	0.32
Cleaner No. 1	6.4	3.0	2.0	-	-
Cleaner No. 2	6.4	.8	.8	0.16	.03
Total	-	8.3	6.0	1.76	0.35

No low-silica products were obtained by flotation of manganese even when fine grinding was employed. The poor results may be attributed to the floatability of siliceous minerals coated with manganese oxides. In general, results were inferior to those obtained by coarse gravity concentration.

Flotation of Silica

Tests were run in the attempt to float silica from sized fractions of deslimed ore with a cationic reagent, thus leaving manganese minerals in the tailing. The best test gave a recovery of 58.1 percent at a grade of 39.7 percent Mn. The addition of marginal silica concentrates raised the manganese recovery to 73.4 percent and lowered the grade to 36.2 percent Mn. These two products would sinter to 44.7 percent and 40.8 percent Mn, respectively. As results were inferior to those obtained by gravity methods, no further details will be given.

CONCLUSIONS

1. The manganese oxide ore from the Sheep Mountain property contained a portion of the siliceous gangue so closely associated with the manganese minerals that concentrates low in silica were not produced by ore-dressing methods. However, enough coarse barren gangue was present to permit effective gravity treatment for the production of intermediate-grade concentrates.

2. Jigging and tabling of minus 3/8-inch ore with no middling re-treatment recovered 69.9 percent of the manganese at a grade of 42.1 percent Mn or 77.2 percent at a grade of 35.8 percent Mn. Both products met Metals Reserve Company marketing specifications without sintering.

3. Jigging and tabling with re-treatment of middlings recovered 81.0 percent of the manganese in a product that, when sintered, assayed 46.7 percent Mn.

4. Concentrates obtained by fatty-acid flotation of manganese from deslimed ore contained only 56.1 percent of the total manganese in a product that would sinter to plus 44 percent Mn.

5. Silica flotation from sized fractions of deslimed ore recovered only 58.1 percent of the manganese at a grade of 39.7 percent Mn or 73.4 percent at a grade of 36.2 percent Mn. These products sintered to 44.7 percent and 40.8 percent Mn, respectively.

SHEEP MOUNTAIN MANGANESE

The U. S. Bureau of Mines has released results of concentration tests performed on a sample of manganese ore from the Sheep Mountain property located about 8 miles west of Durkee, Baker County, Oregon. The information is published in Report of Investigations 4149, November 1947. Test work was done at the Bureau 's Salt Lake City station on a 290-pound sample submitted by the State Department of Geology and Mineral Industries. The crude oxide ore contained 23 percent manganese with intimately associated silica as the principal gangue. Beneficiation tests included both gravity and flotation methods. Best results, obtained by jigging and tabling produced a concentrate assaying 42.1 percent manganese with a 69.9 percent recovery.

Taken from ORE.-BIN Vol. 9, No. 12, page 101

6/46

Sheep Mountain Manganese — Manganese

NAME — OLD NAMES — PRINCIPAL ORE — MINOR MINERALS

T	R	S
11S	42E	33 and
12S	42E	4-5

Baker ..... COUNTY

Powder Burnt River ..... AREA

5327 ..... ELEVATION

Access by Cow Creek Road ..... ROAD OR HIGHWAY

..... DISTANCE TO SHIPPING POINT

PUBLISHED REFERENCES

Brittain U.S.G.S. Bull 879 page 113
[redacted] War Minerals Report 167
Purdue - USGS. Bull 725 p[redacted]
Bryan - 14A
" 17

MISCELLANEOUS RECORDS

PRESENT LEGAL OWNER (S) John Gilbert — Address Baker - Oregon
Nadine Strayer — " "

OPERATOR none

Name of claims	Area	Pat.	Unpat.
2			✓

Name of claims	Area	Pat.	Unpat.

EQUIPMENT ON PROPERTY none

DEPARTMENTAL RECORDS on file in	P'land	G.P.	Baker
REPORTS Sheep Mountain Group HRL June 13, 1942			✓
[redacted]			
Report on Manganese H.F. Anderson (ME) 12/22/41			✓
Supplement No. 2 report to HRL report NSW 12-1953	X		X
SHIPMENT AND ASSAY RECORDS			
MAPS			
Sheep Mt Manganese - Exploration Work by HRL 1942 (tracing)			✓
" " " Surface + sections by John Arthur 5/22/41			✓
" " " TUNNEL NO. 1 U.S.B.M. 9-18-52	✓		✓