

92H/7E

GEOLOGICAL AND GEOCHEMICAL REPORT

by

D.B. Kilby, B.A.Sc.

J.M. Newell, P.Eng.

on surveys completed during May 1972

on the

NIGHTHAWK CLAIMS

situated on the
Tulameen River, 6 miles northwest of Princeton

in the

SIMILKAMEEN MINING DIVISION

49°N, 120°W, S.W.

(NTS 92-H-6)

and owned by

TEXAS GULF, INC.

September 1972

Vancouver, B.C.

3905

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Department of	
Mines and Petroleum Resources	
ASSESSMENT REPORT	
NO. 3905	MAP.....

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Geological and Geochemical Report
Nighthawk Claims
Similkameen Mining Division

Introduction

The Nighthawk claims are underlain by a mixed sequence of volcanic rocks that have been intruded by a granitic plug. Interest in the property was based on a strong geochemical anomaly, in soils, along the CPR right of way, on the west side of the Tulameen River. Claims were staked in June and October 1971.

Compass lines were run, the area was mapped on a 1" = 400' scale, and soil and rock chip samples were taken in May 1972.

Location, Access and Ownership

The Nighthawk claims are situated about 6 miles northwest of Princeton on the west side of the Tulameen River. Access is provided by a good gravel road from Princeton via Coalmont.

The Nighthawk claims consist of ten full-sized claims and two fractional claims, staked in the name of Texas Gulf Sulphur Company in October 1971. The claims are listed below.

Nighthawk 1-10
Nighthawk 11-12 fractions.

Regional Geology

The claims are underlain by volcanic rocks of the Triassic Nicola Group as described in GSC Memoir 243 "Geology and Mineral Deposits of the Princeton Map-Area" (Rice, 1947).

Property Geology

An andesitic volcanic sequence, dominated by tuffs, lapilli tuffs and agglomerates, trends northwesterly through the property.

The andesitic sequence is cut by a granitic plug on Nighthawk 7 claim. Composition of this intrusion changes gradually from diorite through to quartz monzonite. Grain size varies from fine to medium. Disseminated pyrite occurs throughout the intrusion.

Chloritization is the predominant form of alteration, although some epidote was seen around epidote veins and lenses. Andesitic rocks, especially those near the intrusion, are heavily chloritized. All mafics in the intrusion have been altered to chlorite.

Pyrite mineralization is common throughout the property, but is concentrated in and around the intrusion, both as disseminations and as massive veins in shears. Copper mineralization is, with a few exceptions, confined to shears, fractures, and quartz veins in the highly chloritized andesites near the granitic plug. Mineralization is very low-grade and in many cases only malachite was seen.

Geochemistry

Soils

A total of 496 soil samples were taken at 100 foot intervals, on lines 400 feet apart. Samples were collected from shallow holes dug with a mattock or shovel. The "B" soil horizon was sampled where possible and careful notes were made on soil texture and local topography where it might affect results. Estimates of the depth of overburden were made whenever possible. The samples were collected in Kraft paper envelopes and shipped to the Bondar-Clegg and Co. Ltd. laboratory in North Vancouver, for copper and molybdenum analyses.

The analytical technique is summarized as follows: the samples were first dried and sieved to obtain the -80 mesh fraction. Combined metal is extracted from a weighed sample of this fraction with Le Fort aqua regia. The resulting solutions are bulked to a 20% acid concentration and analysed by atomic absorption spectrophotometry, in constant comparison with both synthetic and matrix standards. Results are expressed in parts per million total metal content.

A statistical analysis of the results indicated that the threshold of interest is approximately 60 ppm total copper. Contours were drawn at 60 ppm, 120 ppm, 240 ppm, and 480 ppm.

Anomalies are closely related to areas where the overburden is shallow, especially over rock cuts on the CPR right of way. The strong copper anomaly, situated approximately midway between the railway bridges, can be related to weak copper mineralization in shears, fractures and quartz veins in highly chloritized andesites.

Rock Chips

Rock chips were taken on most outcrops. Where an outcrop extended for more than 200 feet (particularly along the railway) samples were taken over 200 foot intervals. Samples were shipped to the Bondar-Clegg geochemical laboratory where they were pulverized and analysed for total copper and molybdenum, using the method described previously. Results showed that rock chip highs corresponded to soil highs and to areas where weak copper mineralization was found.

Conclusions

The fractured contact zone around the granitic intrusion contains weak copper mineralization where it is exposed. More extensive mineralization, possibly of higher grade, may be concealed by the overburden west of the railway.

D. B. Kilby

D.B. Kilby

DBK:mcc

Atwell.

STATEMENT OF QUALIFICATIONS

D.B. Kilby obtained his B.A.Sc. degree in Geological Engineering, from the University of British Columbia in 1971. He has been employed by Texas Gulf, Inc, during the summer months from 1968 to 1972. He is a competent exploration geologist, well qualified to carry out the exploration programme undertaken on this property.

B.D. Ratcliffe is a student at the University of British Columbia, who has seven summer's field experience in geochemical sampling, six of them employed by Texas Gulf, Inc.

B. Boonstra is a third year Geology student at the University of British Columbia. He has had one previous summer's field experience with Texas Gulf, Inc. I regard him as a competent and conscientious field assistant.

R.J. Marshall has not had previous field experience. His work on this property, undertaken under close supervision, is regarded as in-field training.



J.M. Newell, P.Eng.

DOMINION OF CANADA:
 PROVINCE OF BRITISH COLUMBIA.
 To Wit:

In the Matter of Assessment work carried out on the Nighthawk Mineral Claims, situate on the Tulameen River, 6 miles northwest of Princeton, in the Similkameen Mining Division.

I, John M. Newell, agent for Texas Gulf, Inc.
 of 701-1281 West Georgia Street, Vancouver 5, B.C.

in the Province of British Columbia, do solemnly declare that during May 1972, I caused assessment work to be done on the Nighthawk Mineral Claims, to the value of \$3,225. The expenses were incurred as follows:-

<u>Grid Preparation, Geochemical Sampling and Geological Mapping.</u>			
D.B. Kilby	16 days @ \$40		\$ 640.00
B.D. Ratcliffe	7 days @ 25		175.00
B. Boonstra	9 days @ 25		225.00
R.J. Marshall	5 days @ 20		100.00
496 soil sample analyses	@ 2.20/sample		1091.20
56 rock chip analyses	@ 2.75/sample		154.00
<u>Report Writing and Supervision</u>			
D.B. Kilby	3 days @ \$40		120.00
J.M. Newell	½ day @ 100		50.00
<u>Room and Board</u>			
37 man-days @ \$10/day			370.00
<u>Transportation</u>			
½ month vehicle rental @ \$450/month			225.00
<u>Drafting, etc.</u>			
			75.00
			<hr/>
			<u>\$3225.00</u>

And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the *City*
 of *Vancouver*, in the
 Province of British Columbia, this *4*
 day of *October*, 1972, A.D.



S. Jeanotte
 A-Commissioner for taking Affidavits for British Columbia or
 A-Notary Public in and for the Province of British Columbia.

SEE MINING RECORDER

In the Matter of

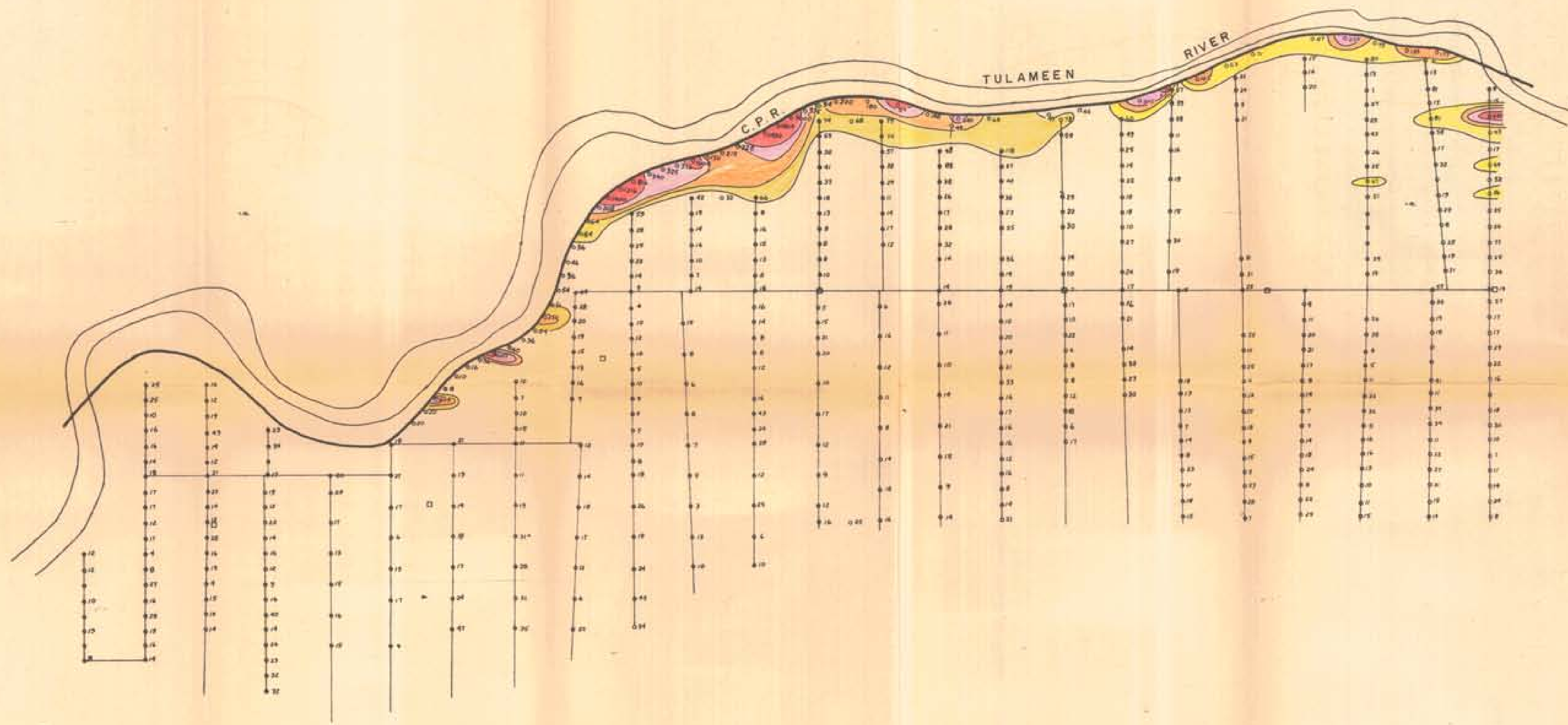
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.....

Statutory Declaration
(CANADA EVIDENCE ACT)



MINE AND PETROLEUM RESOURCES
 ASSESSMENT REPORT
 NO. 3905
 LEGEND #3

- 60 - 120 ppm
- 120 - 240 ppm
- 240 - 480 ppm
- 480 - 960 ppm

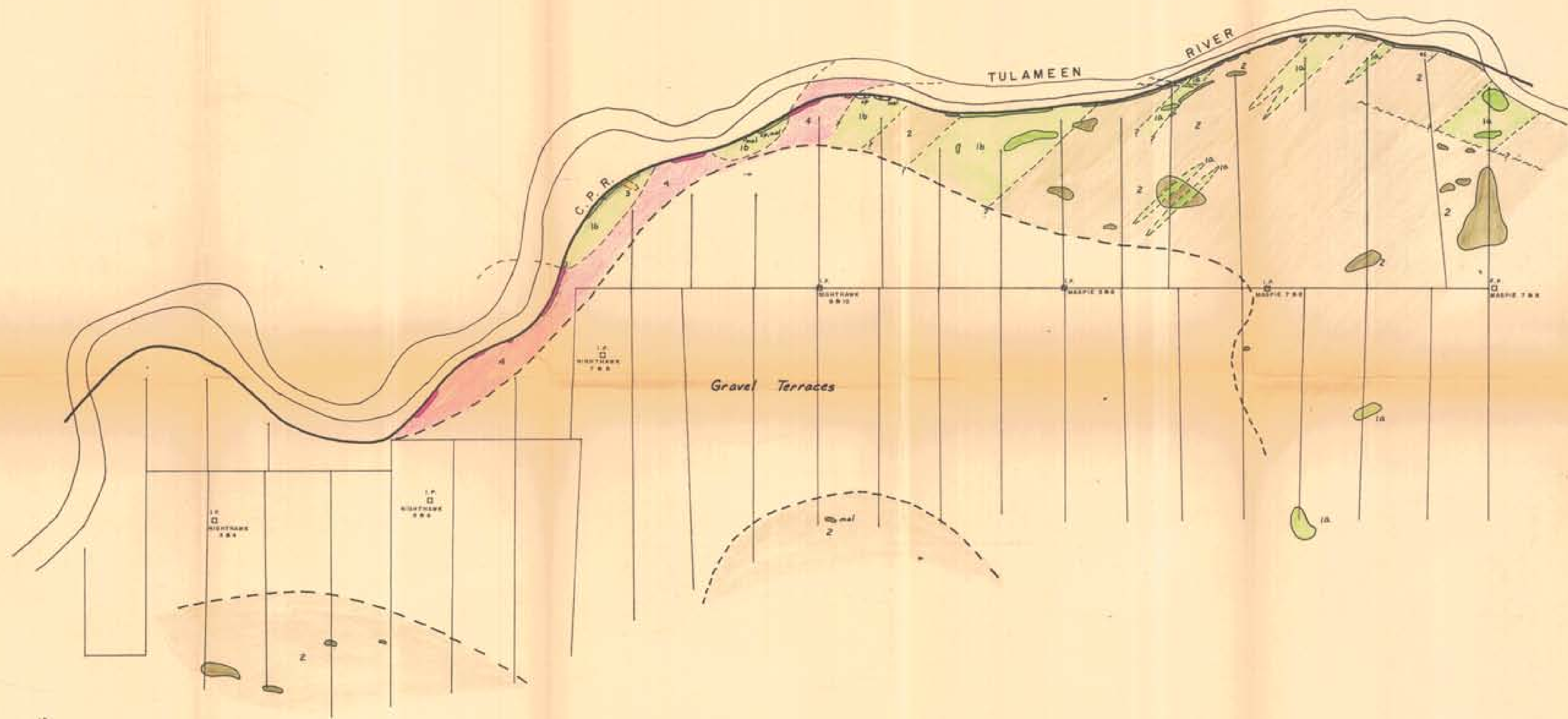
To Accompany: Geological and Geochemical Report
 by D.A. Kilby and J.M. Newell on
 surveys completed during May 1972
 on the Nighthawk Claims,
 Similkameen Mining Division.



Handwritten signature



TEXAS GULF SULPHUR CO.		
SOIL GEOCHEMISTRY		
(TOTAL COPPER)		
NIGHTHAWK CLAIMS		
WORK BY	DRAWN BY	DATE
B.R., B.B., & O.K.	D. KILBY	MAY, 1972



LEGEND

- 1 ANDESITE - Fine grained to amygdaloidal.
(1a) Minor chloritic alteration
(1b) Highly sheared & chloritized
- 2 Andesitic fragmentals, tuffs, lapilli tuffs and agglomerates.
- 3 RHYOLITES - White to light grey.
- 4 GRANDDIORITE - Composition ranges from diorite to quartz monzonite.

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3905 MAP #1

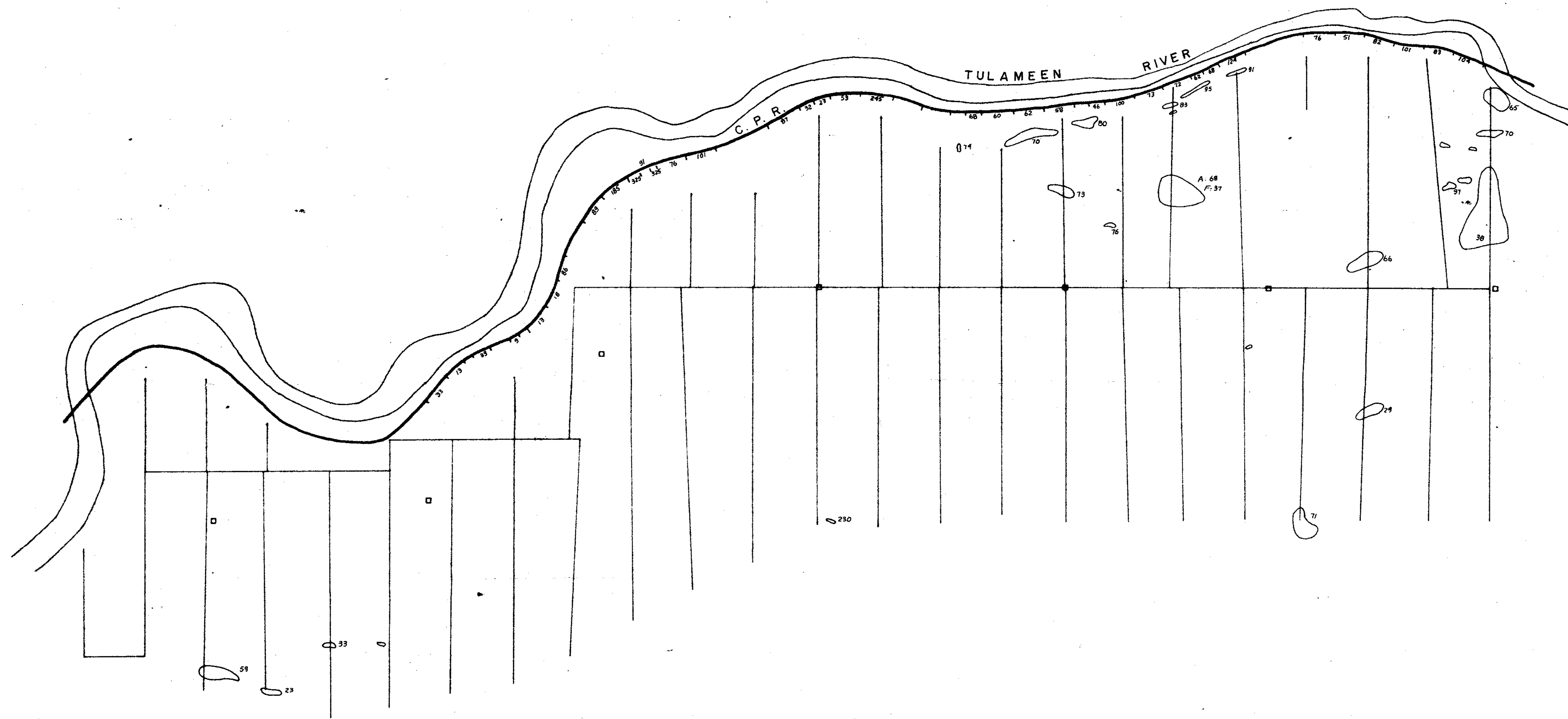
To Accompany: Geological and Geochemical Report by
D.R. Kilby and J.M. Howell on
surveys completed during May 1972
on the Nighthawk Claims,
Sierrakameen Mining Division.



SCALE: ONE INCH = 400'

TEXAS GULF SULPHUR CO.		
GEOLOGY		
NIGHTHAWK CLAIMS		
WORK BY	DRAWN BY	DATE
D. KILBY	D. KILBY	MAY, 1972

13905 M-1



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3905 MAP #5

To Accompany: Geological and Geochemical Report
by D.B. Kilby and J.M. Newell on
surveys completed during May 1972
on the Nighthawk Claims,
Similkameen Mining Division.



SCALE: ONE INCH = 400'

TEXAS GULF SULPHUR CO.		
ROCK CHIP GEOCHEMISTRY		
TOTAL COPPER (PPM)		
NIGHTHAWK CLAIMS		
WORK BY	DRAWN BY	DATE
D. KILBY	D. KILBY	MAY, 1972



BONDAR-CLEGG & COMPANY LTD.

geologists • geochemists • analysts

1500 PEMBERTON AVENUE, NORTH VANCOUVER, B.C.
PHONE 988-5315

GEOCHEMICAL LAB REPORT

No. 22-143

Extraction hot aqua regia

From TEXAS GULF SULPHUR CO.

Method atomic absorption

Date May 15, 1972 19

Fraction Used -80 mesh

Analyst K.B.

SAMPLE NO.	Cu ppm	Mo ppm						REMARKS
476	104	2						
477	83	1						
478	101	2						
479	82	1						
480	51	1						
481	76	2						
482	124	2						
483	68	1						
484	62	1						
485	72	2						
486	73	2						
487	100	2						
488	46	2						
489	58	2						
490	62	1						
491	60	1						
492	68	2						
493	245	2						
494	53	1						
495	33	3						
496	13	ND						
497	33	ND						
498	9	1						
499	13	ND						
500	18	2						
551	86	ND						
552	89	ND						
553	185	1						
554	325	3						
555	91	8						
556	76	4						

GEOCHEMICAL LAB REPORT

SAMPLE NO.	Cu ppm	Mo ppm	SAMPLE NO.	Cu ppm	Mo ppm	REMARKS
557	101	3	H 1583	25	ND	
558	87	ND	1584	77	ND	
559	33	7	1585	26	ND	
560	23	2	1586	35	ND	
561	38	2	1587	86	ND	
563	65	1	1588	52	2	
564	97	1	1589	64	ND	
565	66	ND	1590	17	ND	
566	29	1	1591	63	ND	
567	71	1	1592	540	ND	
568	91	2	1593	15	ND	
569	95	2	1594	9	ND	
570	83	1	1595	31	ND	
571	37	ND	1596	13	1	
572	68	1	1597	81	1	
H 1551	177	2	1598	58	ND	
1552	139	2	1599	17	ND	
1553	79	2	1600	32	ND	
1554	255	1	1601	19	ND	
1555	87	5	1602	29	ND	
1556	71	ND	1603	8	ND	
1557	63	ND	1604	25	1	
1558	165	2	1605	19	1	
1559	490	14	1606	21	ND	
1560	305	1	1607	13	ND	
1561	46	2	1608	6	ND	
1562	49	ND	1609	27	1	
1563	68	ND	1610	17	ND	
1564	240	2	1611	17	ND	
1565	49	1	1612	29	ND	
1566	168	4	1613	22	ND	
1567	750	6	1614	16	ND	
1568	180	5	1615	18	ND	
1581	19	ND	1616	30	ND	
1582	26	ND	1617	10	ND	

GEOCHEMICAL LAB REPORT

SAMPLE NO.	Cu ppm	Mo ppm	SAMPLE NO.	Cu ppm	Mo ppm	REMARKS
H 1618	7	ND	H 1653	38	ND	
1619	11	ND	1654	9	ND	
1620	14	ND	1655	5	ND	
1621	24	ND	1656	11	ND	
1622	8	ND	1657	22	ND	
1623	14	ND	1658	36	ND	
1624	19	ND	1659	5	ND	
1625	31	ND	1660	16	ND	
1626	27	ND	1661	16	ND	
1627	22	ND	1662	13	ND	
1628	11	ND	1663	10	ND	
1629	34	ND	1664	11	ND	
1630	34	ND	1665	15	ND	
1631	11	ND	1666	25	ND	
1632	41	ND	1667	22	ND	
1633	18	ND	1668	8	ND	
1634	19	ND	1669	24	ND	
1635	36	ND	1670	18	ND	
1636	55	ND	1671	14	ND	
1637	19	ND	1672	7	ND	
1638	39	ND	1673	7	ND	
1639	51	ND	1674	14	ND	
1640	67	ND	1675	9	ND	
1641	35	ND	1676	17	ND	
1642	26	ND	1677	21	ND	
1643	43	ND	1678	20	ND	
1644	25	ND	1679	11	ND	
1645	27	ND	1680	9	ND	
1646	7	ND	1683	28	1	
1647	13	ND	1684	31	ND	
1648	80	2	1685	31	1	
1649	15	ND	1686	21	ND	
1650	16	ND	1687	9	ND	
1651	20	ND	1688	24	1	
1652	26	ND	1689	22	ND	



GEOCHEMICAL LAB REPORT

No. 22-155

Extraction hot aqua regia
Method atomic absorption
Fraction Used -80 mesh

From TEXAS GULF
Date May 23, 1972 19
Analyst K.B.

SAMPLE NO.	Cu ppm	Mo ppm						REMARKS
H - 1751	17	ND						
1752	24	1						
1753	27	ND						
1754	10	ND						
1755	18	ND						
1756	18	ND						
1757	22	ND						
1758	14	ND						
1759	25	ND						
1760	49	ND						
1761	60	ND						
1762	73	1						
1763	59	1						
1764	29	ND						
1765	22	ND						
1766	30	ND						
1767	14	ND						
1768	10	ND						
1769	16	ND						
1770	21	ND						
1771	14	ND						
1772	38	ND						
1773	23	ND						
1774	30	ND						
1775	17	ND						
1776	6	ND						
1777	18	ND						
1778	12	ND						
1779	8	ND						
1780	8	ND						

GEOCHEMICAL LAB REPORT

SAMPLE NO.	Cu ppm	Mo ppm	SAMPLE NO.	Cu ppm	Mo ppm	REMARKS
H - 1781	6	ND	H - 1816	14	ND	
1782	22	ND	1817	21	ND	
1783	10	ND	1818	14	ND	
1784	17	ND	1819	9	ND	
1785	7	ND	1820	15	ND	
1786	19	ND	1821	21	ND	
1787	14	ND	1822	14	ND	
1788	36	ND	1823	10	ND	
1789	35	ND	1824	11	ND	
1790	23	1	1825	26	ND	
1791	38	ND	1826	14	ND	
1792	40	ND	1827	5	ND	
1793	37	ND	1828	15	ND	
1794	118	1	1829	21	ND	
1795	48	ND	1830	20	ND	
1796	88	3	1831	10	ND	
1797	38	ND	1832	17	ND	
1798	26	ND	1833	12	ND	
1799	17	ND	1834	9	1	
1800	28	ND	1835	12	ND	
1801	32	1	1836	16	ND	
1802	14	ND	1837	35	ND	
1803	14	ND	1838	16	ND	
1804	10	1	1839	18	ND	
1805	20	ND	1840	14	ND	
1806	14	ND	1841	8	ND	
1807	21	ND	1842	11	ND	
1808	33	ND	1843	12	ND	
1809	16	ND	1844	16	ND	
1810	17	ND	1845	6	ND	
1811	16	ND	1846	10	ND	
1812	16	ND	1847	8	ND	
1813	12	ND	1848	8	ND	
1814	16	ND	1849	8	1	
1815	8	ND	1850	13	ND	

GEOCHEMICAL LAB REPORT

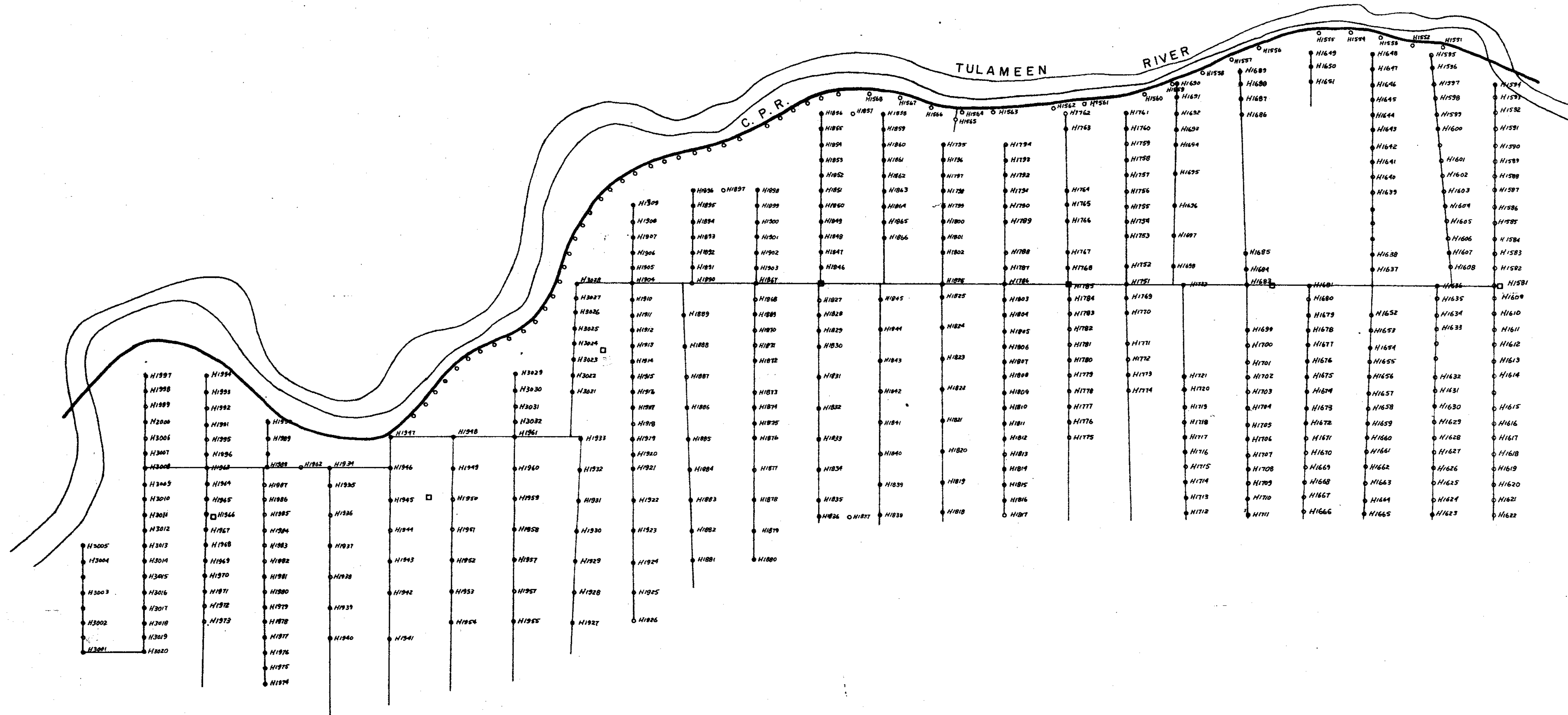
SAMPLE NO.	Cu ppm	Mo ppm	SAMPLE NO.	Cu ppm	Mo ppm	REMARKS
H - 1851	18	1	H - 1886	8	ND	
1852	33	ND	1887	6	ND	
1853	41	1	1888	8	ND	
1854	38	ND	1889	15	ND	
1855	59	1	1890	14	ND	
1856	74	2	1891	7	ND	
1857	68	3	1892	10	ND	
1858	79	3	1893	16	ND	
1859	70	3	1894	14	ND	
1860	57	2	1895	19	ND	
1861	38	1	1896	42	ND	
1862	29	ND	1897	32	ND	
1863	11	ND	1898	66	ND	
1864	14	ND	1899	8	ND	
1865	17	ND	1900	16	ND	
1866	12	ND	1901	12	ND	
1867	16	ND	1902	13	ND	
1868	16	ND	1903	8	ND	
1869	14	ND	1904	9	ND	
1870	8	ND	1905	14	ND	
1871	8	ND	1906	22	ND	
1872	12	ND	1907	25	ND	
1873	16	ND	1908	28	ND	
1874	43	ND	1909	59	ND	
1875	24	ND	1910	4	ND	
1876	28	ND	1911	10	ND	
1877	12	ND	1912	12	ND	
1878	25	ND	1913	10	ND	
1879	6	ND	1914	5	ND	
1880	10	ND	1915	10	ND	
1881	10	ND	1916	9	ND	
1882	13	ND	1917	9	ND	
1883	3	ND	1918	5	ND	
1884	5	ND	1919	10	ND	
1885	7	ND	1920	8	ND	

GEOCHEMICAL LAB REPORT

SAMPLE NO.	Cu ppm	Mo ppm	SAMPLE NO.	Cu ppm	Mo ppm	REMARKS
H - 1921	18	ND	H - 1956	31	ND	
1922	26	ND	1957	28	ND	
1923	19	ND	1958	31	ND	
1924	24	ND	1959	19	ND	
1925	43	ND	1960	11	1	
1926	34	ND	1961	11	ND	
1927	22	ND	1962	18	ND	
1928	4	ND	1963	21	ND	
1929	12	ND	1964	23	ND	
1930	17	ND	1965	14	ND	
1931	18	ND	1966	12	ND	
1932	14	ND	1967	28	ND	
1933	12	ND	1968	16	ND	
1934	20	ND	1969	19	ND	
1935	23	ND	1970	4	ND	
1936	17	ND	1971	15	ND	
1937	13	1	1972	10	ND	
1938	15	ND	1973	14	ND	
1939	16	ND	1974	32	ND	
1940	15	ND	1975	32	ND	
1941	9	ND	1976	23	ND	
1942	17	ND	1977	26	ND	
1943	19	ND	1978	14	ND	
1944	6	ND	1979	40	ND	
1945	17	ND	1980	16	ND	
1946	27	ND	1981	9	ND	
1947	18	ND	1982	12	ND	
1948	21	ND	1983	16	ND	
1949	19	ND	1984	14	ND	
1950	14	ND	1985	22	ND	
1951	18	ND	1986	12	ND	
1952	17	ND	1987	19	ND	
1953	24	1	1988	17	ND	
1954	47	ND	1989	34	ND	
1955	35	1	1990	23	ND	

GEOCHEMICAL LAB REPORT

SAMPLE NO.	Cu ppm	Mo ppm	SAMPLE NO.	Cu ppm	Mo ppm	REMARKS
H - 1991	43	ND	H - 3026	20	ND	
1992	19	ND	3027	28	2	
1993	12	ND	3028	44	1	
1994	16	ND	3029	10	ND	
1995	14	ND	3030	7	ND	
1996	12	ND	3031	10	ND	
1997	25	ND	3032	15	ND	
1998	25	ND				
1999	10	ND	501	70	ND	
2000	16	ND	502	74	1	
3001	8	ND	503	230	ND	
3002	19	ND	504	33	ND	
3003	10	ND	505	59	ND	
3004	12	ND	506	23	ND	
3005	12	ND	562	70	2	
3006	16	ND	573	76	ND	
3007	14	ND	574	80	1	
3008	18	ND	575	73	1	
3009	17	ND				
3010	17	ND				ND denotes not detected
3011	12	ND				
3012	17	ND				
3013	4	ND				
3014	8	ND				
3015	27	ND				
3016	16	ND				
3017	28	ND				
3018	19	ND				
3019	16	ND				
3020	14	ND				
3021	7	ND				
3022	16	ND				
3023	13	ND				
3024	15q	ND				
3025	19	ND				

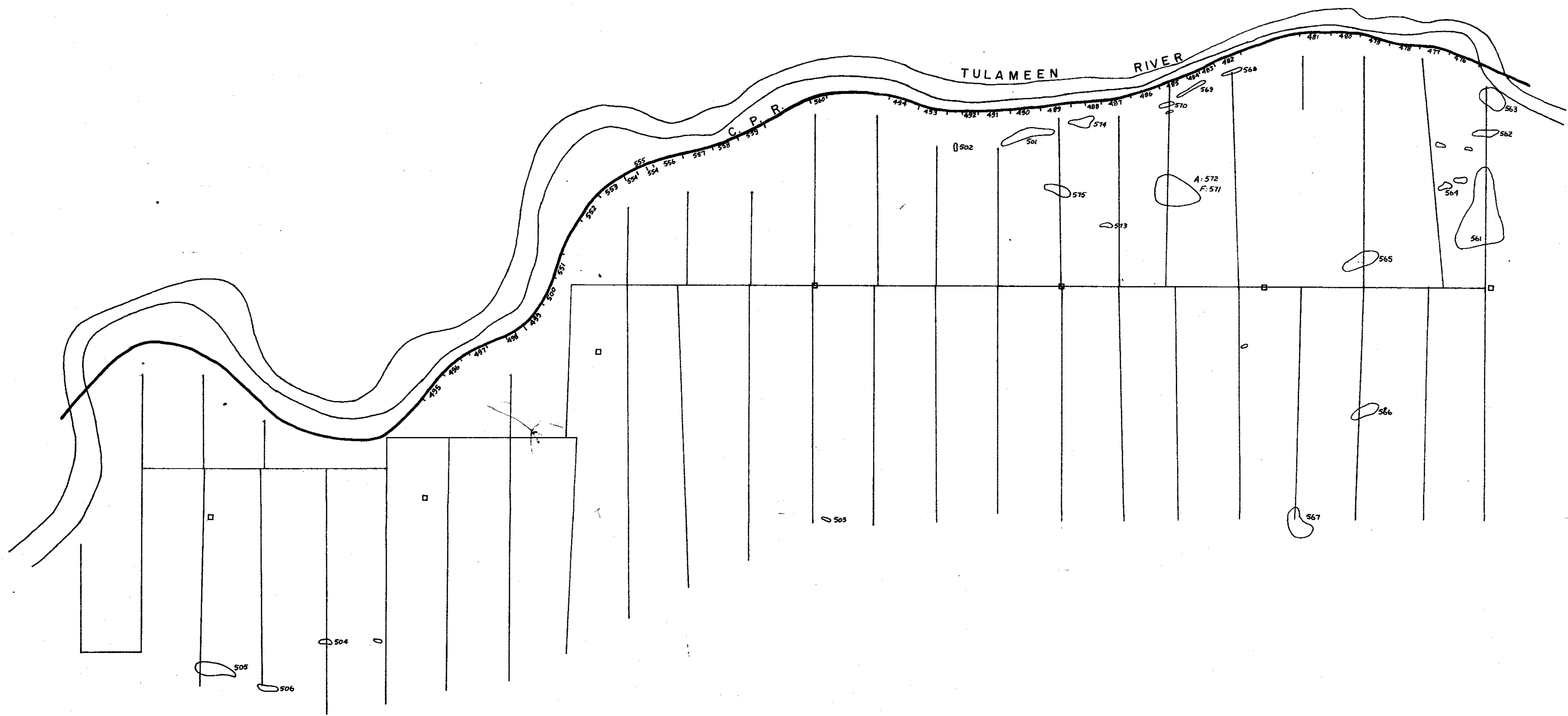


Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3905 MAP #2



SCALE: ONE INCH = 400'

TEXAS GULF SULPHUR CO.		
SOIL GEOCHEMISTRY (SAMPLE NUMBERS)		
NIGHTHAWK CLAIMS		
WORK BY	DRAWN BY	DATE
B.R., B.B., & D.K.	D. KILBY	MAY, 1972



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3905 MAP #4



SCALE: ONE INCH = 400'

TEXAS GULF SULPHUR CO.		
ROCK CHIP GEOCHEMISTRY (SAMPLE NUMBERS) NIGHTHAWK CLAIMS		
WORK BY	DRAWN BY	DATE
D. KILBY	D. KILBY	MAY, 1972