GREAT WESTERN PETROLEUM CORPORATION

GEOLOGICAL AND GEOCHEMICAL REPORT

GWP 19, 20, 41, 43 (GWP III GROUP)

OMINECA MINING DIVISION

BRITISH COLUMBIA

NTS: 94E/6E

57°21'N 127°05'W

OWNER: GREAT WESTERN PETROLEUM CORPORATION

AUTHOR: LOUISE K. ECCLES

T. hocles

DATE: December 1981



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The GWP 19, 20, 41 and 43 claims are located along the south side of the Toodoggone River and cover the lower reaches of Saunders Creek, a north flowing tributary of the Toodoggone River.

The claims, approximately 30 km. due north of Smithers, B.C. (Figure TJV-81-25), are accessible by fixed wing aircraft from Smithers or Terrace to Sturdee Valley airstrip and by helicopter from there.

The area occupies the lowlands along the Toodoggone River and a gentle north facing slope. Elevations range between 1000 and 1400 meters. Numerous small lakes and swampy ponds dot the landscape.

Limited bedrock exposure is confined to creek gullies, particularly the Saunders Creek Canyon.

Frost heaving of bedrock is probably the cause of patches of coarse, blocky flesnmeer seen in some areas of the claims.

Black spruce forest covers most of the claims except along the Toodoggone River flood plain where thick



Figure TJV-81-25 LOCATION - GWP III Group Of Claims

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willow buckbrush is extensive.

Work done on the claims in the summer of 1981 consisted of geological mapping and geochemical grid sampling.

PROPERTY DEFINITION

History

The area north of Toodoggone River has a history of gold placer mining dating back to the 1920's. In the 1960's interest in porphyry copper and molybdenum deposits spurred companies to explore the widespread gossan zones that exist over much of the region.

Denison Mines did a geological and geochemical survey over parts of the southern portion of the claims and this work is recorded in Assessment Report 4091, (B.C. Ministry of Energy, Mines & Petroleum Resources) dated November 30, 1972.

Lacana Mining held a block of 18 units called the Canyon claim that covered the canyon on the lower reaches of Saunders Creek. This claim was allowed to lapse in August 1981 and the GWP 43 claim was staked over the area by Great Western Petroleum that same month. The type of work performed by Lacana on the ground is not known.

The GWP 19, 20 and 41 claims were staked in January 1981.

List of Claims

CLAIM NAME RECORD	NO. UNITS	RECORDED
GWP 19 350	6 15	January 12/81
GWP 20 350	7 21	January 12/81
GWP 41 352	0 18	January 12/81
GWP 43 403	3 20	August 25/81

Claims are shown on Figure TJV - 81 - 26.

Owner and Operator

The claims are recorded in the name of Great Western Petroleum Corporation and are operated by that Company under a joint venture agreement with E & B Explorations Ltd. of Calgary.

Economic Assessment of the Property

Lack of outcrop on much of the claim group hinders



Figure. TJV-81-26

LOCATION OF GWP 19, 20, 41, & 43 MINERAL CLAIMS (GWP III GROUP) assessment. The claims are centrally located in an area of known gold/silver occurrences, prospects and a producing gold/silver mine. The Toodoggone area has the potential to become the next major "gold camp" in British Columbia.

Outcrop in a canyon near the mouth of Saunders Creek (one the GWP 43 claim) exhibits numerous gossans and silicified zones within the middle unit of the Toodoggone Volcanic assemblage which may have potential for gold and silver mineralization.

GEOCHEMICAL SURVEY

Sample Collection and Prepartion

For control on the west side of Saunders Creek, 100 m. x 200 m. grid was put in over the GWP 19 and 20 claims. The baseline for this grid was run along the southern boundary of the two claims.

On the GWP 41 claim a north/south baseline was run along the east boundary of the claim and lines spaced 100 meters apart were run to the west for 1500 meters. The grid on GWP 41 only covered the southern half of the claim. No soil lines were run over the GWP 43 claim, however rock chip sampling was undertaken on some of the more accessible areas of the Saunders Creek canyon.

All grid lines were run using hip chains and compasses and 1:10,000 scale topographic maps for control.

Soil horizons are well developed over areas not covered by swamp or talus. Soil samples were collected from depths of 10 - 25 cm. and placed into gussetted, high strength, brown paper sample bags. Most of the samples were dried in ovens and seived to -80 mesh in stainless steel seives before being shipped to Min-En Laboratories in North Vancouver for analysis.

A 1:10,000 scale topographic map was used as a base for plotting sample locations and results. The total area sampled was about 14.5 square kilometers.

Silt samples were collected from creeks and dry gullies encountered on the grid lines.

Rock samples were collected from available outcrop and sent for geochemical analysis to the same lab.

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A total of 414 soil, 10 silt and 22 rock samples were collected and geochemically analyzed for copper, lead, zinc, silver and gold. Some analysis for molybdenum was done for samples collected earlier in the season.

Refer to Appendix A for analytical procedures.

INTERPRETATION

Values for gold, silver, lead, zinc and copper are plotted for Figures TJV-81-28 to 32, located in the back pockets of this report.

Several individual, isolated samples showed anomalous values for gold and silver that ranged up to 245 ppb and 19.8 ppm respectively.

A cluster of samples anomalous in gold or silver occurs on the GWP 19 claim close to the boundary with GWP 43. Outcrop is non-existent in the areas of anomalous results rendering interpretation difficult.

Two copper soil anomalies in the central portion of GWP 20 have values of 89 and 202 ppm. The samples are separated by over 10 meters and it is not known whether they are related. Outcrop of green Toodoggone porphyry was found. nearby.

One isolated lead anomaly (72 ppm) is coincident with an anomalous silver value (5.0 ppm). Lead geochemistry is considered to be insignificant on the property.

Values for zinc ranged between 23 ppm and 670 ppm. The GWP 41 claim had consistently higher values for zinc than did GWP 19, 20 and 43.

Scattered swamps throughout the area probably effect some of the results, by creating false anomalies. Generally, no samples were collected in areas of extensive swamp cover.

No soil lines have been run on the GWP 43 claim yet, but Lacana Mining (previous owner of the claimed area) reported silt values for gold up to 5000 ppb.

Rock geochemistry on the GWP 43 showed gold values to range between 10 and 60 ppb and silver values to range between 0.5 ppm and 1.7 ppm. Results were lower than expected, possibly due to surface leaching.

GEOLOGICAL FIELD WORK

Geological mapping was done in conjunction with soil geochemistry. Topographic maps and airphoto mosaics at a scale of 1:10,000 and the geochemical grids served as controls for geological mapping.

Geology was plotted at a scale of 1:10,000 and is shown on Figure TJV-81-33, in the back pocket of this report. Total area mapped was about 14.5 square kilometres.

Over the entire claim area rock exposures are poor due to thick overburden. The creek canyons and the top ledge of the terrace above the Toodoggone River are the only places that outcrops are prevalent.

GENERAL GEOLOGY

The GWP III Group, lying within the eastern margin of the Intermontaine Belt is mainly underlain by rocks of the Toodoggone Volcanic assemblage. Granitic rocks, part of the Omineca Intrusions, were found on the GWP 41 claims.

A total of eight rock types were identified on the claims, seven of which are various phases of the Middle and Upper units of the Toodoggone Volcanic Assemblage.

DETAILED GEOLOGY

TOODOGGONE VOLCANIC ASSEMBLAGE

MIDDLE UNIT

For the purpose of this report the Middle Unit of the Toodoggone Volcanic Assemblage is divided into three mappable geologic phases which are probably closely related to each other, being derived from the same parent magma. The phases include Green Toodoggone Porphyry, Pink Quartz-Feldspar Porphyry and Silicified Pyritic Volcanic rocks.

<u>Green Toodoggone Porphyry</u> - This phase is the most abundant on the property. These rocks are commonly dark green with pink to orange phenocrysts of feldspar up to 3 mm in size. Mafic minerals (hornblende and minor biotite) are commonly altered to chlorite and/or epidote. The feldspar phenocrysts show alteration to kaolinite.

<u>Pink Quartz-Feldspar Porphyry</u> - This rock, originally thought to be an intrusive phase of the Toodoggone Volcanics, is now regarded as a phase of the above unit. Field relationships indicate a gradational change between it and the Green Groundmass Toodoggone Porphyry These rocks usually have a pink to greenish, fine grained groundmass with hornblende phenocrysts (often altering to chlorite and epidote). The rock is weakly to strongly magnetic due to finely disseminated magnetite.

This unit occurs in the southern part of the GWP 20 claim, along a creek gully adjacent to tuffs of the Upper Toodoggone Volcanic Unit.

<u>Silicified, Pyritic Volcanic Rocks</u> - Original rock textures are commonly entirely obliterated by intense silicification and kaolinization, however it is assumed that this phase belongs to the Middle Toodoggone Volcancic Unit as it is always closely associated with it within the bounds of the GWP III Claim group.

These rocks display intense limonite staining and often contain abundant disseminated pyrite and arsenopyrite. Occasionally the groundmass is greenish-grey with "ghosts" of brownish orange feldspar phenocrysts still visible, however usually the rock is white and quite bleached.

In areas where these rocks outcrop, primarily along canyon walls of Lower Saunders Creek, intense fracturing is evident.

UPPER UNIT

The Upper Unit of the Toodoggone Volcanic Assemblage is composed of crystal and lithic tuffs.

Lavender Crystal Tuff - These rocks have a fine grained lavender groundmass with white feldspar phenocrysts up to 3 mm. in size.

The rock is well indurated and unaltered and is commonly seen forming cliffs and ridges. Outcrops of the rock were only observed on the GWP 41 claim.

<u>Green to Grey Crystal Tuff</u> - These rocks are very similar to the Lavender Crystal Tuffs except that they have a green to grey groundmass.

<u>Black Tuff</u> - This rock is slightly darker than the grey to green crystal tuff due to the abundance of hornblende, biotite and dark grey to black quartz eyes. Only one small outcrop of this rock occurs in the southern part of the GWP 20 claim. At this location it is closely associated with the Lithic Tuff.

Lithic Tuff - Along with phenocrysts of feldspar and

hornblende which are common in all the tuffs of the Upper Toodoggone Volcanic Unit, these rocks show well rounded quartz eyes up to 2 mm. across and lithic fragments up to 4 cm. across. These rocks have a fine grained, dark grey groundmass and are often magnetic. Outcrops of Lithic Tuff occur in the southern portions of the GWP 41 and GWP 20 claims.

Granitic Rocks

Granitic rocks of the Omineca Intrusive series are found in two localities within the GWP 41 claim. In one area the intrusive body appears as a small plug several hundred metres across, apparently intruding crystal tuffs of the Upper Toodoggone Unit. The other locality is near the northernmost extent of outcrop on the claim. The size of this second granitic mass is not known.

This medium to coarse grained, pink to green rock has minor chlorite and epidote alteration of the biotite and hornblende crystals. White to greenish feldspar and grey quartz phenocrysts up to 1 cm. are common as are fine grained, grey lithic fragments.

The weathered surface is pink with a pitted texture due to weathering of hornblende and biotite.

STRUCTURE

On the GWP 41 claim granitic rocks intrude interbedded crystal and lithic Tuffs of the Upper Toodoggone Volcanic Unit. The bedding attitudes of the tuffs dip away from the intrusive suggesting doming.

An outcrop of tuff on the GWP 20 claim strikes northwest and dips southerly similar to regional attitudes on adjacent claims.

MINERALIZATION

Numerous gossans and silicified zones with abundant disseminated pyrite and arsenopyrite are closely associated with unaltered Green Groundmass Toodoggone Porphyry. The canyon on the lower reaches of Saunders Creek appears to be the most interesting area for potential precious metal mineralization. To date, however, rock geochemistry has failed to show significant values.

Isolated soil samples with anomalous copper, lead, zinc, silver or gold values in areas with no bedrock exposure are difficult to assess.

CONCLUSIONS AND RECOMMENDATIONS

Geological and geochemical surveys on this claim group are severely hampered by extensive overburden, swamp and general lack of bedrock exposures.

Areas that appear most interesting geologically are not coincident with the areas of anomalous soil geochemical values.

The creek that cuts through part of the GWP 41 claim has not been prospected at its lower reaches. A canyon exists between the Toodoggone River flood plain and where it crosses the easternmost claim line of GWP 41. Potential rock exposures in this creek would help define the extent of the granitic rocks in this area. Soil geochemistry on the northern half of the GWP 41 claim and over the central portion of the GWP 43 may indicate more areas to be followed up.

If possible, trenching and additional rock geochemistry should be undertaken on the silicified, pyritic zones in the canyon area of Saunders Creek in the event that surface leaching is the cause of low values of gold and silver.

Geochemical Surveys and Geological Mapping

1. WAGES

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Name	Per Diem <u>Rate</u>	Specific Dates	No. Days	Amount
L. Eccles (geologist)	\$116.58	June 19	1	\$116.58
D. Forster (geologist)	93.73	July 7, Aug. 13, 14 22	4	\$374.92
N. Caira (geologist)	83.51	June 20-22, July 7, July 8, 12, 13	7	\$584.57
R. Green (sampler)	52.85	June 18, 19	2	\$105.70
K. Hudson (sampler)	52.85	June 18, 19, July 12, 13, Aug. 13, 23	6	\$317.10
C. Leupold (sampler)	57 .96	June 19, Aug. 11, 14	3	\$173.88
R. Riedel (sampler)	57.96	June 18, 19	2	\$115.92
L. Tamaki (sampler)	63.06	June 18, July 9, 11, 12, 29, Aug. 2	6	\$378.36
L. Connolly (sampler)	73.28	June 18	1	\$ 73.28
I. Hribar (cook)	66.38	(proportioned amongst other claims - 10.03% x 61 days)	6.12	\$406.24
C. Carter (lab technician)	52.85	(proportioned amongst other claims - 10.03% x 38 days)	3.81	\$201.43
. Proportion c to this Grou	of General Ca p: 10.03% x	amp Days allocated 256 days @ \$70.09	25.68	\$1799.95
			67.61	\$4650.94

2. TRANSPORTATION

A. Mobilization

	Charter aircraft - Smithers/Sturdee Strip: (total of \$6970.60 - Kelowna Flightcraft Aircharter Invoice No. 4733B and Trans- provincial Airlines Invoice No. 67308, split between properties)	\$699.12
Β.	Demobilization	
	Charter Airfract - Sturdee Strip/Smithers (part of Aviair Aviation Invoice No. 0450) Air Fare (5 crow, Smithers (Vanseyver 0	\$ 74.62
	\$510.25 - proportioned)	<u>\$51.18</u> \$125.80
C.	Helicopter Support	
	Viking Helicopters - Total 95.25 hrs. split between properties = 9.55 hrs. @ \$428.00/hr., including fuel; June 18-22, July 7-9, 11-13, July 29, Aug. 2, 13, 14, 22, 23:	\$4087.40
	ALC Airlift Corporation - Total 12.18 hrs. split between properties = 1.22 hrs. @ \$415.00/hr. including fuel; between July 30- Aug. 1:	\$ 506.30
	· · · · · · · · ·	\$4593.70

3. CAMP COSTS

A. Room and Board

67.61 man days @ \$50.00/day (including all or parts of June 18-22, July 7-9, 11-13, 29, Aug. 2, 13, 14, 22, 23)

B. Expediting

(split between properties) Total \$1411.13 -Bema Industries Invoice Nos. 0990 - July 15/81 " 0934 - June 30/81 0852 - June 15/81 0805 - May 31/81

\$141.54

\$3380.50

4. <u>GEOCHEMICAL ANALYSIS</u>

	<u>414</u> soil samples, <u>10</u> silt samples analyzed for Cu, Pb, Zn, Ag, Au @ \$10.55 per sample - (analysis done by Min-En Labs)		\$4367.70
	22 rock samples analyzed for Cu, Pb, Zn, Ag, and Au @ \$11.95 per sample (analysis done by Min-En Labs)		262.90
	Sample shipment costs and supplies (Min-En Labs Invoices) - Total \$1431.45 - proportioned	5	143.57
	To	otal =	\$4774.17
5.	REPORT PREPARATION	-	
	Writing and Drafting		\$400.00
	Surveys Ltd total \$4242.11 (proportioned)		\$425.48
			\$825.48

SUMMARY OF COSTS:

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1. 2.	Wages Transportation:	A. Mobilization B. Demobilization	\$4,650.94 699.12 125.80 4 593 70
3.	Camp Costs:	A. Room and Board B. Expediting	3,380.50 141.54
4. 5.	Geochemical Ana Report Preparat	lysis ion	4,774.17 <u>825.48</u>
		TOTAL	= \$19,191.25

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APPENDIX 'A'

ANALYTICAL PROCEDURES

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APPENDIX 'A'

ANALYTICAL PROCEDURES

Samples are processed by Min-En Laboratories Ltd. in North Vancouver employing the following procedures:

After drying the samples at 95°C soil and stream sediment samples are screened by 80 mesh sieve to obtain the minus 80 mesh fraction for analysis. The rock samples are crushed by a jaw crusher and pulverized by ceramic plated pulverizer.

1.0 gram of the samples are digested for six hours with HNO_3 and $HC10_4$ mixture.

After cooling samples are diluted to standard volume. The solutions are analyzed by Atomic Absorption Spectrophotometers.

Copper, Lead, Zinc and Silver are analyzed using the CH_2H_2 - Air flame combination on these sample solutions.

For gold geochemical samples, a suitable weight 5.0 or 10.0 grams are pretreated with HNO_3 and $HC1O_4$ mixture.

After pretreatments the samples are digested with <u>Aqua</u> <u>Regia</u> solution, and after digestion the samples are taken up with 25% HCI to suitable volume.

At this stage of the procedure copper, silver and zinc can be analyzed from suitable aliquot, by Atomic Absorption Spectrophotometric procedure.

Further oxidation and treatment of a least 75% of the original sample solutions are made suitable for extraction of gold with Methyl Iso-Butyl Ketone.

With a set of suitable standard solutions, gold is analyzed by Atomic Absorption instruments. The obtained detection limit is 5 ppb.

QUALIFICATIONS

I, LOUISE K. ECCLES, do hereby certify that:

 I am a geologist residing at 782 West 22nd Avenue, Vancouver, British Columbia and am employed by Great Western Petroleum Corporation.

3.

- 2. I am a graduate of the University of British Columbia with a B.Sc. (Honors) degree in geology.
 - I have practised my profession in geology continuously for the past four years in British Columbia, Ontario, Yukon and Northwest Territories.
- 4. Between June and the end of August, I directed a field program on the GWP 19, 20, 41, and 43, claims on behalf of Great Western Petroleum Corporation.

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L.K. Eccles October 1981

ATTESTATION

I, Nicholas C. Carter of Victoria, British Columbia, do hereby certify that:

- 1. I am a practising geologist, registered with the Association of Professional Engineers of British Columbia since 1966.
- 2. I am a graduate of the University of New Brunswick with BSc. (1960); Michigan Technological University with M.S. (1962) and the University of British Columbia with Ph.D. (1974).
- 3. I have practised my profession in British Columbia and Eastern Canada and the Western United States for the past 21 years.
- 4. I personally oversaw the geological and geochemical program carried out on the GWP III Group and will attest to the authenticity of data contained in this report.

A Clarite 12. D. V. E. M. N.C. Carter Ph.D., P.Eng.













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