Boucher Creek Property
1985 Exploration Report

721

ATNA RESOURCES LTD.

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March 1, 1987

Mr. Paul Hagen
Coal Administrator
Room 412, 617 Government Street
Victoria, B.C.
V8V 4S2

Dear Mr. Hagen:

Re: BOUCHER CREEK COAL PROPERTY
Lapsed Licenses #8075-8077

Herewith please find our report on the Boucher Coal Licenses.

Our work on the area had demonstrated that we should not pursue the area further. Accordingly, we chose not to renew the licenses.

We appreciate that this report does not fully conform to all the relevant regulations but we would hope that all the inventory information you require is contained and that since no further work is planned, the report will be sufficient.

Yours truly,

ATNA RESOURCES LTD.

Colin P. Harivel
Director

CPH/sf

Encl.

ATN/4:35

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BOUCHER CREEK PROPERTY
1985 EXPLORATION REPORT

COAL LICENSE NO. 8075 - 8087

WEST CENTRAL BRITISH COLUMBIA - BAIT RANGE

N.T.S. - 93M/9W, 93M/10E

LATITUDE - 55° 35' N

LONGITUDE - 126° 30' W

LICENSES HELD BY - ASHTON W. MULLAN

OPERATOR - ATNA RESOURCES LTD.

AUTHOR - DR. THOMAS A. RICHARDS

WORK PERFORMED - AUGUST TO DECEMBER, 1985

DATE SUBMITTED - MARCH 1, 1987

INDEX

FIGURES AND TABLES

FIGURES

TABLES

Boucher Creek Coal

Location and Access

The Boucher Creek Coal licenses are located along the east margin of the Babine Valley, in west-central British Columbia, in N.T.S. map sheet, Hazelton (93M). Its geographic centre is situated at 55° 33' 23" north latitude and 126° 28' 26" west longitude.

The property is 105 km northeast of Smthers and 80 km east of Hazelton. Access to within 7 km of the property is available via a forest access logging haul road from Smithers to the Nilkitkwa River, and within 2 km by two-wheel drive fire access branch roads off the main haul road. Present access is by foot or by helicopter based from Smithers.

Figure 1 LOCATION MAP - BOUCHER CREEK COAL PROPERTY

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Physiography

The property lies astride the southeastern boundary of the Skeena Mountains and the northeast boundary of the Nechako Plateau. (Holland, 1964). The property lies on a gently west-dipping upland plateau surface with a general elevation of 1500 meters. The north boundary and the centre (Boucher Creek) of the license area are transected by west flowing creeks, with a uniform gradient at 1100 meter's elevation. Valley slopes are of moderate-steep inclination except along the south slope of Boucher Creek, where steep cliffs are defined by conglomerate exposure.

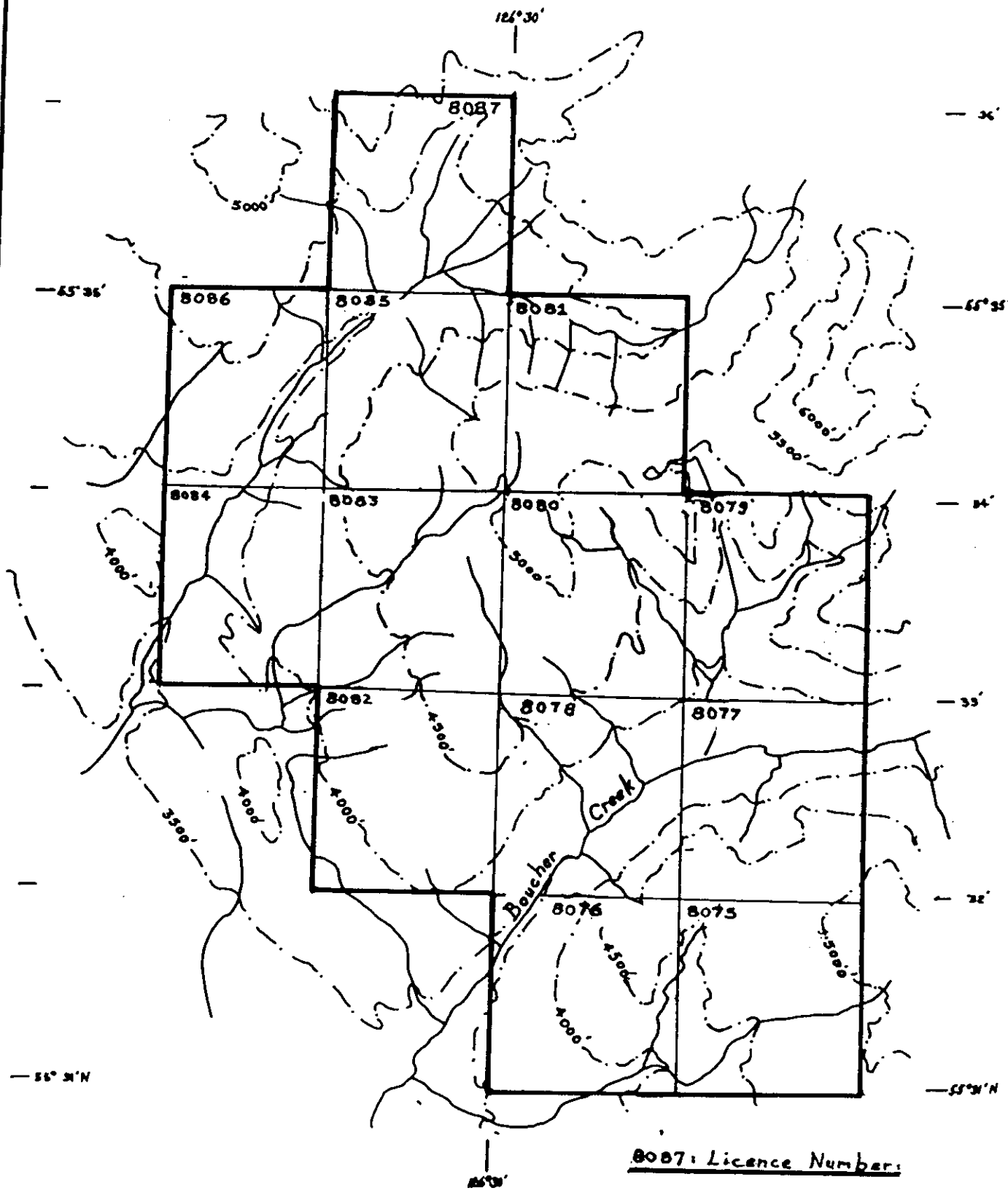
Vegetation ranges from mature spruce-balsam fir forests in valley bottoms to scrub alpine balsom fir at upper elevations. Much of the western part of the license is covered by an extensive burn-area, estimated to be 20 years old.

Climate is typical of the northern Interior, with cold winters and cool summers. Snow leaves the upper slopes in June and returns in early October.

Figure 2 COAL LICENCE MAP

Boucher Creek Coal Property, 3809 Hectares

Hazelton Map-area (93M/9W-10E), Omineca M.D., Cassiar Land District



8087: Licence Number

ATNA RESOURCES LTD.

Property History

No previous work has been reported on the Boucher Creek Coal occurrences prior to the commencement of this investigation in 1984.

Initial work in the area was stimulated by a high Pb/Zn/As silt geochemical sample in Boucher Creek, reported in the National Geochemical Reconnaissance program for the Hazelton map area (Nts 93M; G.S. C open file 1000). Follow-up on this sample site revealed the presence of common float of coal in a south-flowing side creek into Boucher Creek (chunks to 15 cm) and a small exposure of a one metre seam in Boucher Creek. Subsequent follow-up revealed the presence of a prominent carbonaceous layer to the north. Analysis of the coal float showed the samples to be of anthracite and meta-anthracite rank (Pearson Report, 1984, appendix). As the geological setting of these occurrences appeared similar to the Sustut coal measures presently being investigated by Suncor Inc. Resources Group (Schroeter and White, 1984), a decision to apply for a license was taken.

Figure 3 REGIONAL GEOLOGY

Bouchar Creek Coal Property

Hazelton Map-area (93M)

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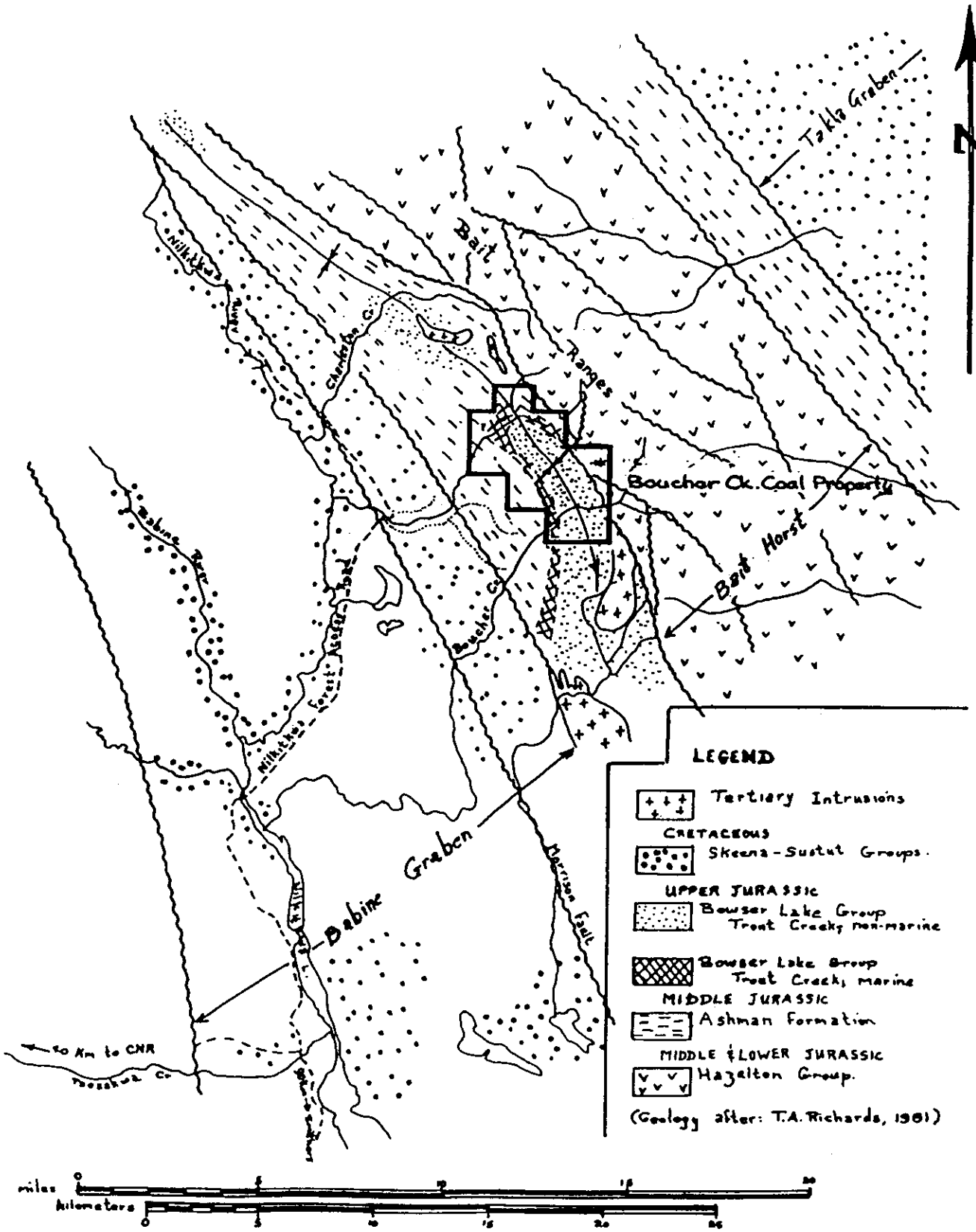

Regional Geological Setting

The Boucher Creek coal showings are within the Upper Jurassic (Oxfordian) assemblage of the Bowser Lake Group (Tipper & Richards, 1976). The Trout Creek assemblage represents the first influx of coarse grained clastics into the Bowser Basin and the distribution of the facies defines the margin of the basin. The Trout Creek assemblages conformably overlie the middle to upper Jurassic (Callovian-Lower Oxfordian) Ashman Group and probably underlies the Skeena Group.

The Trout Creek assemblage lies along the east margin of the Babine Valley, a major northwest trending graben structure of Tertiary age. Bed rock geology comprises four major stratigraphic units; the Lower and Middle Jurassic Hazelton Group, the Middle and Upper Jurassic Ashman Formation, the Upper Jurassic Bowser Lake Group and the Cretaceous Skeena and Sustut groups (Richards, 1981).

These geologic elements are distributed in north west trending panels separated by major faults whose latest component of movement was dominantly normal.

The Hazelton strata comprises mainly subaqueous volcanics and sedimentary rocks that underlie the main axis of the Bait Range. To the immediate west, separated by a steep west-dipping fault lie the Middle and Upper Jurassic clastic rocks of the Ashman formation and the Bowser Lake Group. The Ashman Formation (Tipper and Richards, 1976) comprises a thick section of well-bedded, planar-bedded, indurated feldspathic grewacke, siltstone, argillite, sandstone and minor thin grey limestone. Fossils are present as random, scattered individuals and comprise ammonites, belemnites and pelecypods that suggest a Callovian and lower Oxfordian age. The facies assemblage is uniform throughout the Babine area, and suggests a distal marine environment of deposition. It is in fault contact with the underlying Hazelton Group.

Overlying the Ashman Formation, and in marked lithologic contrast, are the conglomerates, sandstones, siltstones, shales and minor coal of the Trout Creek Assemblage. This assemblage passes from a shallow marine, shore line facies upwards into a fan-fluvitile facies, and defines the initial stages of development of the inwardly prograding deltaic facies of the Bowser Lake Group (Richards and Jeletzky, 1975). Pebble composition from conglomerates are composed of clasts of volcanics identical to the marine Hazelton Group to the immediate east.

Paleocurrent measurements from a single location south of Boucher Creek suggests a paleoslope trending 300° (13 measurements). Pelecypod fauna in the Trout Creek assemblage indicate an Oxfordian age. Younger strata of the Bowser Lake Group do not appear to overlie the Trout Creek assemblage, as the subsequent strand lines appear to have shifted basinward (Tipper and Richards, 1976, p.36).

To the west is a suite of Lower Cretaceous conglomerates, sandstones, siltstones, shales and carboniferous units of the Skeena Group, in fault contact with the Jurassic clastic assemblages. These strata contain detritus comprised of chert, quartz, feldspar, mica and volcanics in contrast to the Jurasssic suite, and locally broad leaf fauna.

Basin and range structure dominates the present structural setting of the regional geologic setting of the Boucher Creek coal license area. The broad, northwest-trending Babine and Takla valleys represent graben structures, with the Bait Range the complimentary horst structure.

The Bait Range horst dips gently to the southwest. Its western boundary is coincident with the fault separating the Ashman formation from the Skeena Group.

Structures within the horst are governed by synclines. Within the Hazelton Group strata, the general structure is steep eastward dips in the west and gentler to the east outlining an assymetric syncline, modified greatly by cross faults (Richards, 1981). On the fault bounded panel along the west flank of the Bait horst, the distribution of the Ashman formation and Trout Creek Assembalge outlines a syncline, traceable for some 20 km. This structure is complicated by differing intensities in defromation between the two stratigraphic units. The strata of the Ashman formation tends to be much more highly deformed than the Trout Creek, with the former marked by steep dips, and minor folds, while the latter tends to more open structures. This may infer two ages of deformation. The southern part of this structure, across the coal license area, plunges to the south-southeast such that the strata young southerly.

Figure 4 PROPERTY GEOLOGY

Boucher Creek Coal Licence Area,
Hazelton Map-sheet; 93M

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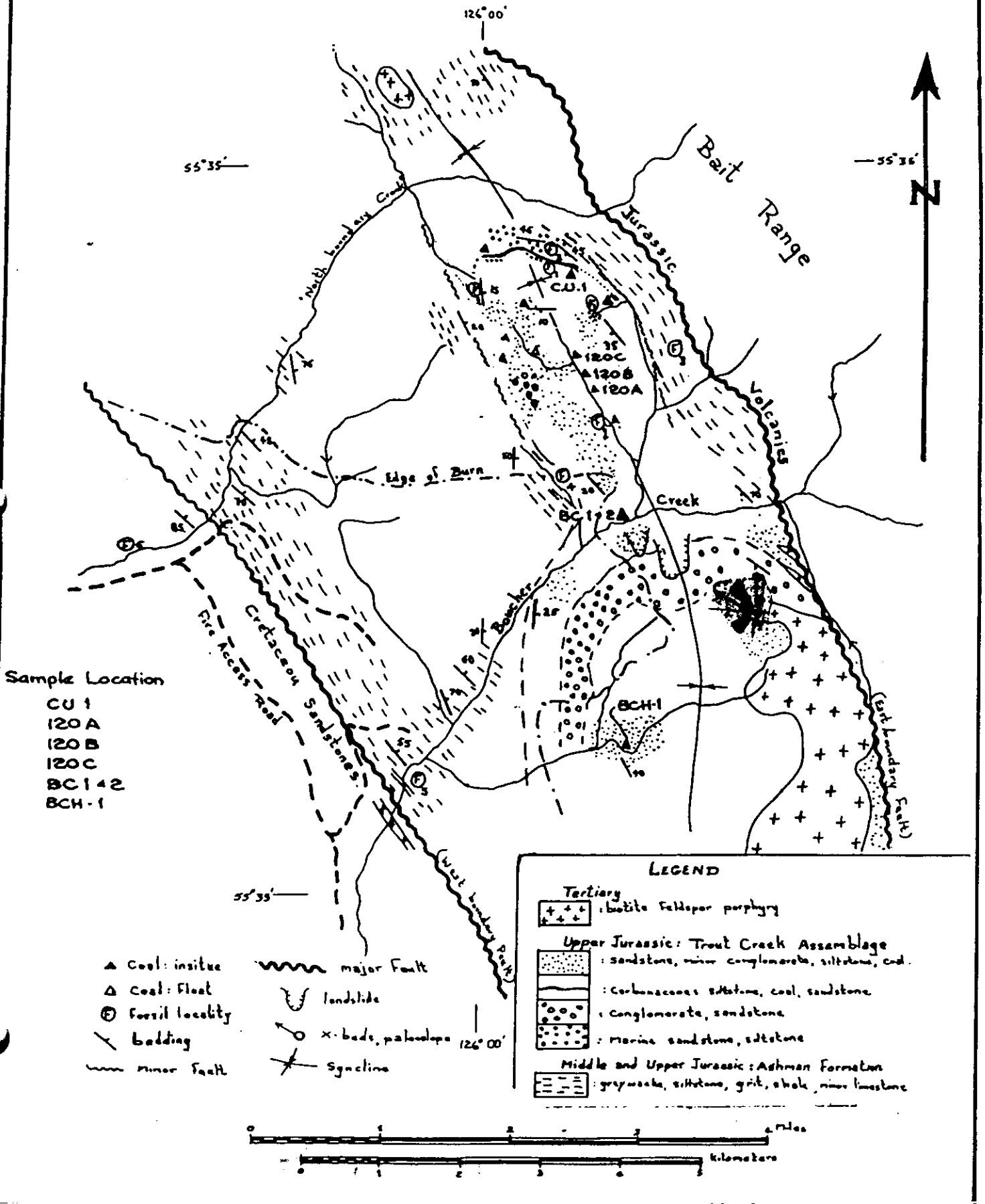


Geology of the Boucher Creek Coal License

The geologic elements of the Boucher Coal License area is outlined in figure 4. It comprises two major units. The distal marine, fine-grained clastics of the Ashman Formation forms the basement strata to the overlying Trout Creek assemblage. The Trout Creek assemblage comprises five informally mappable lithologic units from the base:

- a shoreline marine sandstone unit (to 70 meters thickeness);
- a carbonaceous unit (30 metres);
- a coquinoid siltstone (5 metres);
- sandstone (to 100+ metres); and,
- a conglomerate (to 100 metres).

These are not given map-unit status as insufficient work has been done to establish either continuity of lithologies nor the significance of facies changes. In addition, the influence of minor faults in repreating strata is indeterminate.

The basic structural control is a an open, south-south easterly plunging syncline that infers the traversing of up-section to the south-southwest. Exposures are limited to cliff sections along the north slopes of the major creeks, and isolated outcrops in side creeks and on the upland surface.

Contact between the Ashman Formation and Trout Creek assemblage was not noted. An unconformable relationship is inferred as the Ashman Formation is much more highly deformed and contacted relative to the Trout Creek assemblage, albeit this could simply reflect contrast in competence between a dominantly fine bedded greywacke siltstone facies with a thick bedded sandstone facies.

Ashman Formation

The Ashman Formation strata adjacent to the west boundary fault comprises uniformly thin bedded, indurated siltstones, fine-grained feldspathic greywackes, sandstones and gritty argillite dipping steeply to the east. North of the license boundary, black, finely fractured shale with spherical nodulars to 30 cm comprises the Ashman. The formation adjacent to the east boundary fault consists of finely bedded brownish to light rusty weathering siltstones and greywackes replete with belemnities. Age of the formation is Callovian to Lower Oxfordian (Tipper and Richards, 1976).

Trout Creek - Stratigraphic Units

Lower Marine Sandstones

The lower marine sandstones comprises up to 70 meters of interbedded blanked like, well winnowed, evengrained sandstones, ranging from fine siltstones to pebbly sandstones. Plane lamination is the main sedimentary structure. The facues is exposed for 1200 meters along steep slopes south of the north-boundary creek. The section tends to coarsen upwards to the base of the carbonaceous unit. Lower units contain siltstone members that contain thin limey beds, limey concretions and thin shelled pelecypods. Interrbedded with the lower members, and upwards to the top of the unit, isolated thick shelled pelecypods Trigonia Hetertrigonia doroschini) are present. In the 38 to 45 meter level in this section, these pelecypods are so abundant as to constitute 50% of the rock. All are well preserved, intact specimens.

The lower contact is not exposed. Its upper contact is conformable and abrupt with the carbonaceous unit. The unit is recognized nowhere else.

A Stratigraphic column is shown in table 1.

Age of the unit is likely Upper Oxfordian.

TABLE 1

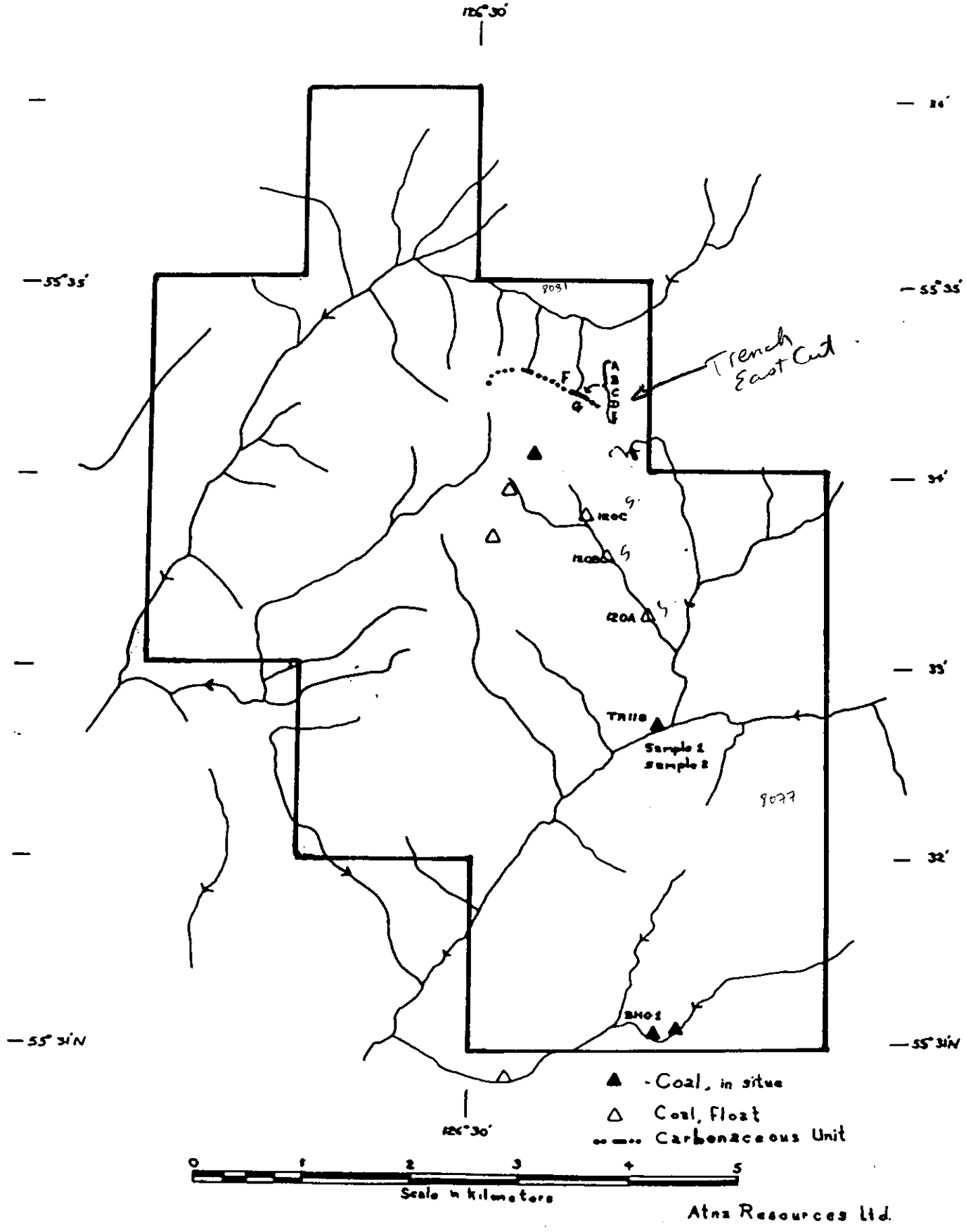
STRATIGRAPHY OF THE BOUCHER CREEK PROPERTY

PERIOD	GROUP	FORMATION OR ASSEMBLAGE	DESCRIPTION
TERTIARY			Intrusives:- feldspar, porphyry dikes and stocks
			Map Units (Trout Creek Assemblage)
			Sandstone-Conglomerate:- medium to coarse grained sandstone, pebble to boulder conglomerate, minor siltstone, shale and coal.
MIDDLE TO UPPER JURASSIC	BOWSER LAKE GROUP	TROUT CREEK ASSEMBLAGE	"Coquinoid" Unit:- feldspathic greywacke-siltstone with abundant fossils.
			Carbonaceous Unit:- finely interbedded carbonaceous siltstones, carbonaceous shales; thin, lensoidal coal, minor claystone, sandstone and volcanic ash horizons.
			Lower Marine Sandstone:- laminated, well-sorted sandstone and siltstone.
		ASHMAN FORMATION	Planar bedded, feldspathic greywacke, siltstone argillite, sandstone and minor thin limestone.
LOWER TO MIDDLE JURASSIC	HAZELTON GROUP	SMITHERS FORMATION (BAIT MEMBER)	Argillite, siltstone, fine-grained greywacke, limestone, conglomerate, tuff and tuffaceous sediments.

FIGURE 5

Coal Occurrences, Boucher Creek Coal Licence

Hazelton Map-area (93M/9W-10E), Omineca M.D., Cassiar Land District



STRATIGRAPHIC SECTION

Base of Section

thickness	meters from base	
0.6	0.0 - 0.6 m	- grey, fine-grained brittle siltstone
0.8	0.6 - 1.4 m	- medium to coarse-grained brown sandstone, thin pebble lenses
0.5	1.4 - 1.0 m	- fine-grained pencil fractured siltstone
2.3	1.9 - 3.2 m	- brown sandstone, medium-grained at base, pebble-lenses in middle, finning upwards, 10 cm limey concretions
6.5	3.2 - 9.7 m	- brown to grey, slightly rusty, alternating siltstone and chip-fractured shale (10 - 30 cm beds); few medium-grained sandstone interbeds (to 10 cm), few grey limestone pods 5 cm X 10 cm in bedding; plane laminated, minor ripples
7.0	9.7 - 16.7 m	- thick-bedded, medium-grained, gritty sandstone; plane laminated and ribbed with 30 - 60 cm fine-grained sandstone interbeds. Belemnites common in irregular orientation, some thick-shelled pelecypods. Sandstone with low matrix; volcanic-feldspar clasts only
2.3	16.7 - 19.0 m	- grey-brown, chip fractured fine golf ball sized limey concretions; rare thin-shelled pelecypods
4.5	19.0 - 23.5 m	- medium to coarse grained sandstone, central 1.5 m pebble conglomerate lenses with common siltstone rip-up clasts; isolated pelecypods
5.5	23.5 - 29.0 m	- grey, finely fractured siltstone, massive to plane laminated; large (60 cm) rounded, grey limestone concretions; isolated thin shelled pelecypods

Thickness (m)	M. frambase	lithology
3.0	29.0 - 32.0	- brown to slightly rusty weathering, flaggy sandstone, occasional carbonized stick impressions
6.0	32.0 - 38.0	- alternating, planar bedded, medium and fine-grained sandstones; 10 - 30 cm coarse-grained to pebbly sandstone pelecypods present near top
8.5	38.0 - 46.5	- medium-grained sandstone; extremely fossiliferous with well preserved, intact pelecypods entirely of one species. Member fossiliferous along strike and across thickness; alternating bands of well washed, matrix free sandstones comprised of 50% shells. species: trigonia - (Vagonia doroschini?)
4.0	46.5 - 50.5	- recessive, flaggy, medium-grained sandstone, plane laminated, few pelecypods
9.5	50.5 - 60.0	- thick-bedded, even grained, medium-grained, massive sandstone, coarsely ribbed with 60 - 150 cm beds separated by 30 - 100 cm slightly more recessive sandstone, fossils very rare; pebble isolated, bedding planar
7.5	60.0 - 67.5	- spheroidal weathering, gritty, recessive, brown weathering sandstone, friable
30.0	67.5 - 97.5	- carbonaceous, coal-bearing unit, recessive
5.0	97.5 -102.5	- Resistant, indurated, brittle, coquinoid feldspathic, gritty siltstone, very rusty weathering.

Top of Section

Carbonaceous Unit

The Carbonaceous unit of up to 30 meters of a recessive assemblage of finely interbedded carbonaceous siltstone, carbonaceous shale, coal, claystone and minor sandstones. Bedding is highly lensoid with interfingering units up to 1 m in thickness. The unit is only exposed across a 150 meter zone south of the "North boundary Creek", where is is covered by a veneer of clayey, fine-grained talus. It weathers black. Exposures can be traced for in access of one kilometer to the west, and to the south, as isolated, small patches of black earth, likely frost heaved. These zones are the site of most of the trenching on the property. Sample locations are shown in Figure 5 and measured sections from the trenches in tables 2.

TABLE 2

Trench; East Cut, Cliff Section

Base	- Brown - grey friable sandstone
0 - 2.5 m	- gritty black, feldspatic sandstone with 10 - 20 cm interlayers of gritty, carbonaceous siltstone.
2.5 - 3.6 m	- Carbonaceous siltstone 5 - 6 cm thin coaly seams
3.6 - 3.7 m	- brownweathering claystone
3.7 - 3.82 m	- coal, glassy and dull seams
3.82 - 4.43 m	- interbedded carbonaceous siltstone and thin fine-grained coaly lenses
4.43 - 4.45 m	- rusty clay
4.45 - 4.50 m	- black Carbonaceous shale
4.50 - 4.68 m	- coal, thin shaley interbeds
4.68 - 6.65 m	- crushed, fine-grained grey to black carbonaceous shale, siltstone and 1 - 2 cm coal interbeds
6.65 - 6.80 m	- coal with carbonaceous siltstone
6.80 - 6.90 m	- brown weathring claystone
6.90 - 7.16 m	- carbonaceous siltstone and shale
7.16 - 7.30 m	- coal, with silt lenses
7.30 - 7.80 m	- three claystone layers interbedded with black carbonaceous shale, thin hairline coal
7.80 -10.00 m	- interbedded sequence of 1-15 cm brown to grey grey claystone, black carbonaceous shale and thin 0.5-2 cm coal. Tops in 10 cm grey sand, coarse-grained at base, fine-grained at top
10.00 - 10.20 m	- carbonaceous shale
10.20 - 10.40 m	- coal, crushed, shale interbeds
10.40 - 11.10 m	- black carbonaceous shale, thin claystone interbeds
11.10 - 12.00 m	- coal, crushed, with abundant shaley interlayers, few thin claystone bands (SAMPLE "A")
12.00 - 12.90 m	- highly crushed rock, coal and carbonaceous shale

12.90 - 14.90 m - highly crushed, mixed coal and rock, chunk coal to 6 cm, glassy and dull (2 SAMPLES "B" & "C")

14.90 - 16.90 m - grey to black siltstone, thin claystone interbeds

16.90 - 17.00 m - coal

17.00 - 17.30 m - black siltstone

17.30 - 17.40 m - coal

17.40 - 21.80 m - alternating sequence of 1 - 10 cm black carbonaceous siltstone, 1 - 10 cm light-grey to beige claystone and 0.5 - 2 cm thin coal; one 10 cm coal at 20.40 - 20.50 m

21.80 - 25.00 m - black carbonaceous silts and interbedded coal, few thin 1 - 3 cm grey claystone at top

(Sampled not analysed)

21.80 - 23.00 mixed coal and carbonaceous shale
23.00 - 24.10 carbonaceous siltstone
24.10 - 25.00 50/50 coal and carbonaceous siltstone (SAMPLE "E")

25.00 - 26.10 m - grey beige claystone with 1 - 3 cm coal and carbonaceous siltstone interbeds

26.10 - 26.60 m - coal, crumbly and crushed

26.60 - 26.80 m - grey claystone

26.80 - 27.80 m - coal, crushed and 40% carbonaceous siltstone

27.80 - 28.00 m - carbonaceous siltstone and coal, crushed

SAMPLE "F"

28.00 - 29.50 m - grey-brown siltstone, highly sheared, minor crushed coal lenses and carbonaceous siltstones

29.50 - 30.00 m - grey-brown siltstone

30.00 - 32.00 m - alternating carbonaceous siltstone and light-coloured sandstone (one 60 cm), 2-8 cm coal lenses

Top

32.00 - 47.00 m - resistant, hard, indurated coquinoid siltstone, abundant variety of pelecypods, brachiopods and gastropods

TABLE 3

Middle Trenches (Upper)

Eastern Trench (Upper)

Base of trench

0.00 - 1.50	- trench in talus
1.50 - 5.50	- alternating assemblages of black to dark grey carbonaceous siltstone with 0.5 - 2 cm coal interbeds
5.50 - 7.50	- five light coloured fine-grained sandstone lenses 20 - 60 cm thick, interbedded with carbonaceous shale and thin coal

Blast Pit - Centre of basin (T7) 3

Top

5 cm - coal
10 cm - claystone
3 cm - coal
10 cm - dark grey clay
3 cm - coal
30 cm - grey sandstone

Blast Trenches - West Side of Synchline - on coal (f) area

12' trench - filled in no rock

90' trench - from sandstone - conglomerate across coal float area; no rock uncovered

TABLE 4

Lake Trench

Section from top-down

meters	
0.0 - 0.9	- carbonaceous black gritty siltstone
0.9 - 1.0	- coal
1.0 - 2.0	- grey, carbonaceous siltstone
2.0 - 2.1	- light grey clay
2.1 - 2.6	- grey, carbonaceous siltstone
2.6 - 2.7	- coal, with grey carbonaceous siltstone
2.7 - 3.8	- grey carbonaceous siltstone
3.8 - 3.9	- coal, with thin (1cm) grey claystone
3.9 - 4.1	- grey carbonaceous siltstone
4.1 - 4.2	- coal, thin clay seams
4.2 - 4.9	- alternating thin, grey claystone, carbonaceous siltstone and thin coal
5.0 - 6.0	- grey, carbonaceous siltstone
6.0 - 6.2	- grey claystone
6.2 - 6.8	- grey-black carbonaceous siltstone, thin coal seams
6.8 - 6.9	- white claystone
6.9 - 7.8	- grey to black carbonaceous siltstone
7.9 - 8.2	- coal
8.2 - 9.0	- 50% alternating grey claystone and coal, very deeply weathered

(additional 50' (15cm) of trench - heavy snow)

TABLE 5

Lake Trench (Note: These samples were NOT analysed)

Sample 10

0.00 - 0.03	- black band
0.03 - 0.33	- dark grey to black siltstone and coal
0.33 - 0.50	- black clay
0.50 - 0.60	- coal
0.60 - 0.70	- grey clay
0.70 - 0.80	- coal
0.80 - 1.20	- alternating grey clay, black clay and thin coal

(1.7 m trench)

Sample 20

0.00 - 0.17	- black carbonaceous coal and claystone
0.17 - 0.27	- light grey clay
0.27 - 0.54	- dominantly black coal and black clay, with thin dark-gray claystone bands
0.54 - 0.64	- light grey clay
0.64 - 1.18	- alternating coal and black claystone, thin dark grey claystone
1.18 - 1.44	- light grey claystone
1.44 - 1.65	- coal and black carbonaceous siltstone

(section very deeply weathered)

(2.4 m of trench 1.8 m of section)

TABLE 6

Sample A 11.10 - 12.00 m

11.10 - 11.27 m - coal

11.27 - 11.35 m - brittle grey claystone

11.35 - 11.50 m - coal with carbonaceous siltstone lenses

11.50 - 11.56 m - rusty coal

11.56 - 12.00 m - crushed coal and carbonaceous silty claystone

Sample B 12.90 - 13.90

Sample C 13.90 - 14.90

Sample D 21.80 - 23.00

Sample E 24.00 - 24.50

24.00 - 24.24 m - alternating 1 - 2 cm coal and carbonaceous siltstone

24.24 - 24.75 m - dominantly coal with carbonaceous siltstone

24.75 - 24.83 m - carbonaceous sandstone

24.83 - 25.00 m - coal

Sample F 26.10 - 28.00

26.10 - 26.59 m - black coal, thin rusty crumbly silt lenses

26.59 - 26.80 m - light grey silty claystone

26.80 - 27.65 m - mixed carbonaceous siltstone and coal

27.65 - 27.80 m - carbonaceous siltstone - crushed

27.80 - 28.80 m - crushed coal and siltstone

TABLE 7

Middle Trenches and Cliff Section

Lower Trench (Western)

Base:	- grey-brown, friable sandstone
0.00 - 0.40 m	- coal, carbonaceous siltstone interlayers of 1 - 3 cm
0.40 - 0.53 m	- brown-beige fine-grained sandstone
0.53 - 0.72 m	- 1 - 3 cm alternating coal and carbonaceous siltstone
0.72 - 1.20 m	- gritty carbonaceous siltstone
1.20 - 1.37 m	- coal with gritty siltstone interlayers
1.37 - 1.90 m	- gritty carbonaceous sandstone with few thin (1 cm) coal seams
1.90 - 2.18 m	- grey, carbonaceous, gritty siltstone
2.18 - 2.32 m	- beige claystone
2.32 - 2.70 m	- grey carbonaceous gritty siltstone, 3 cm coal at top
2.70 - 3.90 m	- interbedded sequence of beige claystone (5 units), 2 - 20 cm, interlayered 1 - 3 cm coal and 3 - 10 cm carbonaceous siltstone
3.90 - 4.30 m	- grey carbonaceous siltstone, gritty stiltstone, 1 - 3 cm interbedded coal

J. Perry Sample at base

approximate volume: 8 m X 2.5 m /2 $30\ m^3$

TABLE 8

Middle Trenches - Cliff Section

Central Trench

Base of trench:

0.00 - 0.90	- coal, minor carbonaceous siltstone and 2 cm brown claystone	
0.90 - 2.30	- black carbonaceous, clayey siltstone and shale, thin coal seams to 1 cm	
2.30 - 2.80	- alternating 1 - 5 cm coal and carbonaceous siltstone	
2.80 - 3.90	- coal, carbonaceous siltstone interbeds at 3.30, 3.60, 3.80; 3 cm claystone at 3.70 m	SAMPLE"G"
3.90 - 5.60	- alternating sequence of 5 - 20 cm gritty carbonaceous siltstone and 0.5 - 2cm coal	
5.60 - 7.50	- light coloured, beige claystone, 3 - 25 cm with carbonaceous wisps and rootlets, thin coal lenses to 3 cm	
7.50 - 8.00	- grey fine-grained sandstone	
8.00 - 8.15	- coal	
8.15 - 8.23	- claystone	
8.23 - 8.28	- coal	
8.28 - 8.73	- interbedded grey siltstone and fine sandstone	
8.73 - 8.78	- coal	
8.78 - 9.00	- beige claystone and carbonaceous siltstone	

volume moved $20\ m^3$

samples: 0.00 - 0.90 m

2.80 - 3.90 m

TABLE 9

Coal Outcrops in Upper Reaches of Boucher Creek (Stop #2)

Apparent Thickness	True Thickness (Approx. metres)	Description
Sample #1		
		Roof - questionable roof close to soil horizon. Carbonaceous claystone with thin bands of coal. Sheared.
0.15	0.15	Coal - several claystone band, lightly sheared and weathered.
	0.15	Coal and Claystone - interbedded, highly sheared.
	0.13	Carbonaceous Claystone - sheared.
	0.11	Coal - highly sheared.
	0.05	Claystone - orange weathering.
Sample #2		
	0.28	Coal - powered & highly sheared Have very thin calcite band at top and a 0.02 m clay band at centre.
	0.03	Clay - Highly sheared, light grey weathering, discontinuous, irregular.
	0.07	Coal - Highly sheared, powdered
	0.03	Clay - Highly sheared, powdered
	0.34	Coal - Highly sheared, powdered Has several thin shale bands
Not Sampled	0.23	Clay - Highly sheared, powdered Has several thin shale bands.
Not Sampled	0.03	Coal - Highly sheared, powdered Claystone.

True Thickness	Sample #1	=	0.49 m
True Thickness	Sample #2	=	0.75 m
	Total:	=	1.24 m

This "outcrop" should be treated with some caution. It may be that coaly sequence has been carried to its present location by a landslide. The bedding within that unit is delicately preserved; if it is not bedrock then it most probably represents a sequence to be found higher up the valley slopes.

Coquinoid Siltstone

This unit is represented by up to 5 meters of brittle, indurated, feldspathic greywacke-siltstone. It ranges from black, argillaceous siltstones to beige siltstones, but is dominantly grey. Abundant fossils, including varieties of pelecypods, brachiopods, gastropods and beleminites, are distinctive to the unit. It may weather rusty.

It is exposed as outcrop and proximal talus across the crest of the upland surface overlooking the "north boundary creek" for some 1200 meters. Minor exposures of the unit were noted 500 meters to the south along the east and west limbs of the syncline.

A small, isolated exposure in the main south-flowing creek into Boucher Creek contains a similar exposure of coquinoid argillaceous siltstone.

The unit in the north part of the license area overlies conformably and abruptly the carbonaceous unit. No other units are adjacent the exposure in the creek. Sandstone overlies the unit.

Conglomerate

South of Boucher Creek, up to 100 m. of thick-bedded conglomerate forms a prominent ledge or cliff. This unit consists of boulder, cobble to pebble conglomerate and sandstone.

Coarse clasts, up to 100 cm diameter (rare), 3 - 15 (common) with a mode of 1 - 2 cm float in a matrix of washed sandstone. Cobble are well rounded. Clast types are composed dominantly of volcanics; including green breccias, red tuff, basalt, feldspar porphyries and aphanitic varieties, cherty tuff and massive and banded argillites, few with belemnite, and granitics. Log and stick impressions are common throughout. Measurements on cross-beds from interbedded sandstones from the eastern exposures of the unit indicates a northwest paleoslope at the time of deposition. Clast composition, excepting the granitic rocks, is correlative with the Hazelton volcanics underlying the Bait Range to the immediate east.

North of Boucher Creek, at elevation 1500 meters on the upland surface west of the main side-creek, similar cobble conglomerates interbedded with coarse-grained sandstone are exposed as isolated subdued outcrops. Bedding here is indiscernable, and thickness is probably a few meters.

Contacts with adjacent members are indistinct. The thick conglomerate south of Boucher Creek appears to be conformably overlain and underlain by sandstone assemblages.

Sandstone Units

Sandstones of probable fluvial origin overlay the Coquinoid unit, and both underlie and overlay the Conglomerate unit. No thickness can be estimated as no complete section is exposed but is likely in excess of 100 meters.

The sandstones north of Boucher Creek are massive, planar to ripple bedded members, ranging from a few centimeters to two meters thickness and range from fine to coarse-grained. Log and stick impressions are common. Minor thin coal was noted. The sandstones are clean, composed of feldspar and volcanic clasts, with few pebbles. The sandstones range from massive, blocky to flaggy fractured units. In the northwest corner of these exposures, small exposures of interbedded, laminated cherty argillite, plane laminated fine-grained siltstone-shale and minor black, sooty siltstone are of possible lacustrine origin.

South of Boucher Creek, medium to coarse-grained sandstones appear to underlie the massive conglomerates. Above the conglomerates, the sandstone assemblage comprises interbedded medium to coarse grained sandstone interbedded with fine siltstone, thin coaly beds and conglomerate lenses similar to the cliff-forming section.

Coal Occurrences

Coal occurrences are widely scattered across the property, both as in situ and float locations. In situ coal was found in the carbonaceous unit, and in the sandstone units both above and below the conglomerate. Float locations are concentrated along the main branch of the south-flowing side creek into Boucher Creek, and across the southwest corner of the upland surface north of Boucher Creek.

Boucher Creek

A single, small exposure in excess of one meter of deeply weathered coal is exposed along the north bank of Boucher Creek in the northwest of license 8077, 100 metres below the mouth of the south-flowing side creek. Exposures in this section of the creek are very rare. The exposure is immediately west of a landslide terrace resultant from a landslide scarp to the south.

South of Boucher Creek

Limited investigation south of Boucher Creek noted thin coal seams in a westerly flowing side creek. At 1100 metres, an irregular bed of 8 to 30 cm thick coal is exposed interbedded with well bedded fine to medium grained sandstone. A further very thin seam noted at 1225 metres elevation, and several 6 cm to 15 cm seams at 1250 meters.

A further 10 - 15 cm coal seam was noted at 1300 metres. Exposures are restricted to creek margins, limited to 20% maximum. The upland surface here is devoid of significant exposure.

The sample at 1100 m. is BH C-1.

See Sample "H".

Blast P.t. T-7

At the extreme northwest head of the south-flowing tributory to Boucher Creek, a small patch of frost heaved black coal soil was noted. Limited trenching on this occurrence revealed the presence of three thin coal seams. Five, 3 and 3 cm. thickness, interbedded with 10 cm layers of grey claystone. The occurrence is capped by and rests upon medium-grained grey-brown sandstone. The trench measures 2 metres depth by 3 metres length, cut into a gentle slope.

No further investigation was attempted.

Float Occurrences

Along the length of the main side creek flowing into Boucher Creek, small chips and local chunks (up to 15 cm) of anthracite coal were noted. No exposures of coal were found. Only two outcrops were noted along this main branch of the creek, a pelecyped coquinoid exposure at 1300 metres, and flaggy sandstone in a side creek at 1400 metres. Coal float was noted along the creek to immediately below an open grassy swamp at 1450 metres.

To the east of this crrek, at approximate elevation 1500 metres, on the upland surface, small chips and chunks (up to 3 cm x 10 cm x 8 cm) platy, hard coal is distributed amongst the heather. Float was noted over an area of 300 x 400 metres. No exposure underlies the float area. Adjacent to the southeast are subdued exposures of sandstone and conglomerate. Two blast trenches, totalling 30 metres revealed only ground moraine and no exposure. The coal source has yet to be located.

Carbonaceous Unit

Thin coal, shaley coal, and carbonaceous shale and siltstone occur throughout the carbonaceous unit, but mainly in its middle and upper middle parts.

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BOUCHER CRK

TO : INTERACTION RESOURCES LTD.
720-800 WEST PENDER ST.
VANCOUVER, B.C. - V6C 2V6

CERTIFICATE NO : A8519285
DATE : January 21st. 1986

We have analyzed the following submitted samples as per instruction received from Dr. T.A. Richards.

SAMPLE NO	BASIS	R.M. %	ASH %	V.M. %	F.C. %	SULFUR %	C.V. BTU/LB	SAMPLE
X-Cut 11.1-12.0 6/10/85	A.D.	2.31	74.63	7.88	15.18	0.21	2452	A
	DRY		76.40	8.06	15.54	0.21	2509	
X-cut 12.9-13.9 TR 6/10/85	A.D.	2.77	68.65	8.86	19.72	0.25	3215	B
	DRY		70.60	9.11	20.29	0.26	3307	
X-Cut 13.9-14.9	A.D.	3.07	74.93	8.71	13.29	0.18	2222	C
	DRY		77.30	8.99	13.71	0.19	2292	
X-cut 24.0-25.0	A.D.	3.43	79.32	9.79	7.46	0.15	1388	E
	DRY		82.14	10.14	7.72	0.15	1437	
X-cut 26.1-28.0	A.D.	2.76	69.64	8.86	18.74	0.38	3031	F
	DRY		71.62	9.11	19.27	0.39	3118	

CERTIFIED BY..... J. Iwata .....

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TO : INTERACTION RESOURCES LTD.
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CERTIFICATE NO : A8513285
DATE : January 21st, 1986

We have analyzed the following submitted samples
as per instruction received from Dr. T.A. Richards.

SAMPLE NO	BASIS	R.M. %	ASH %	V.M. %	F.C. %	SULFUR %	C.V. BTU/LB	SAMPLE
Mid-zone-Central 2.80-3.90	A.D.	3.38	75.64	7.09	13.89	0.37	2266	G
	DRY		78.29	7.34	14.37	0.38	2345	
BH C#1 Oct 3/85	A.D.	1.40	70.37	4.32	23.91	0.10	3470	H
	DRY		71.37	4.38	24.25	0.10	3519	

CERTIFIED BY.....

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TO : INTERACTION RESOURCES LTD.
720-800 WEST PENDER ST.
VANCOUVER, B.C. - V6C 2V6

CERTIFICATE NO : A8517419
DATE : October 24th, 1985

BOUCHER CREEK
STOP #2

SAMPLE NO	BASIS	R.M. %	ASH %	V.M. %	F.C. %	SULFUR %	C.V. BTU/LB
#1	A.D.	3.74	61.16	14.51	20.59	0.30	3997
	DRY		63.53	15.07	21.40	0.31	4152
#2	A.D.	2.86	51.07	19.39	26.68	0.23	5697
	DRY		52.58	19.96	27.46	0.24	5864

CERTIFIED BY.....B. Kwarte.....