PEACE RIVER COALFIELD DIGITAL MAPPING PROJECT, 1992 FIELDWORK (93I/9, 10)

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KEYWORDS: Coal geology, Peace River, digital compilation, Belcourt Creek, Wapiti Lake, stratigraphy, coal exploration, Monkman Park, Kakwa Recreational Area, Belcourt Creek Park.

INTRODUCTION

The mapping completed during the 1992 field season covered the Belcourt Creek (93I/9) map sheet and half of the adjacent Wapiti Lake (93I/10) map sheet (Figure 5-4-1). These map areas straddle the foothills of the Rocky Mountains in northeast British Columbia, at the southeast end of the Peace River coalfield (Figure 5-4-2). This area is of particular interest because of proposed park additions and new parks in the Monkman Pass region which may include segments of the coalfield.

The work done this summer essentially completes the fieldwork for the Peace River coalfield digital mapping project. Since mapping began in 1986, nine maps have been released as Open Files. The Wapiti Lake and Belcourt Creek geology maps will be released as Open Files in early 1993. Maps completed in the Pine Pass - Chetwynd area by Peter Jahans, as part of a Master's thesis at the University of Alberta (Jahans, 1992), will also be released. Part or all of fourteen 1:50 000-scale map sheets will have been completed by the end of the project.

An important adjunct to the field mapping has been the digital compilation of data from previous work in the area. An extensive digital database (including virtually all the outcrop data from coal assessment reports, coal and petroleum drill-hole locations, as well as digital versions of some of the coal report maps) has been compiled for the Peace River coalfield.

Location And Access

The total area mapped in the Belcourt Creek - Wapiti Lake area is approximately 1300 square kilometres, extending from the Outer Foothills in the east to the boundary of the Inner Foothills with the Rocky Mountain Main Ranges in the west. Elevations range from about 1000 to 2000 metres, with treeline at around 1800 metres. Vegetation varies from mature stands of pine and spruce to alpine tundra at higher elevations. Ridges trend predominently northwest, reflecting the underlying geological control. The principal drainages in the area, the Wapiti River, Red Deer Creek and Belcourt Creek, follow wide valleys, and cut across the ridges in a northeasterly direction.

Outcrop is predominantly along the ridge tops, as well as in roadcuts and in the creek and river valleys. In 1987, a large forest fire burned almost 8000 hectares on the north side of Red Deer Creek, making outcrop in the area easier to find.

Road access from the city of Dawson Creek to the map area is by the Old Heritage Highway (52). Within the central part of the map area, logging and well-access roads provide access for four-wheel-drive truck. Mountain bikes were used where roads were impassable by truck. More remote areas in the west and south were reached by helicopter.

DIGITAL COMPILATION AND MAPPING

Most of the data collected during the compilation and field mapping have been incorporated into a digital database. The methodology used has been described to varying degrees in previous articles (Kilby and Wrightson, 1987a, b, c; Kilby and Johnston, 1988a, b, c; Kilby and Hunter, 1990; Hunter and Cunningham, 1991a, b; Cunningham and Sprecher, 1992a, b) and so will only be briefly summarized here.

The database has been compiled from several sources, including coal assessment reports (exploration maps, coal boreholes, exploration reports), oil and gas drill-hole data, earlier mapping by the British Columbia Geological Survey Branch (Gilchrist and Flynn, 1978) and the Geological Survey of Canada (McMechan and Thompson, 1985; Taylor and Stott, 1979). Outcrop data from all these sources have been digitized using an in-house program. Outcrop information collected in the field this year was also incorporated into the database.

Formation boundaries and structural traces were also digitized from coal assessment report maps using *QUIK*-Map, a Geographic Information System (GIS) program. QUIKMap was also used extensively during all phases of map compilation, editing and production for the Le Moray Creek and Carbon Creek map sheets (Cunningham and Sprecher, 1992a, b). Geological traces can be displayed in conjunction with outcrop data. Much of the coal exploration mapping in the area was done at 1:2500 scale. These large-scale, detailed geological maps can be digitized, then edited and incorporated into the final 1:50 000-scale map, preserving detail and accuracy. This ability to display and query all the outcrop data, drill-hole locations and previous mapping simultaneously on the computer screen, allows GIS programs to be used in the interpretive stage of map production, and not simply as a drafting tool.

GEOLOGY OF THE STUDY AREA

Previous Work

Previous mapping in the Monkman Pass area includes 1:50 000-scale mapping completed by the Geological Survey of Canada which covers the southeast corner of 93I (McMechan and Thompson,1985). Taylor and Stott (1979) published the 1:250 000-scale regional map covering all of

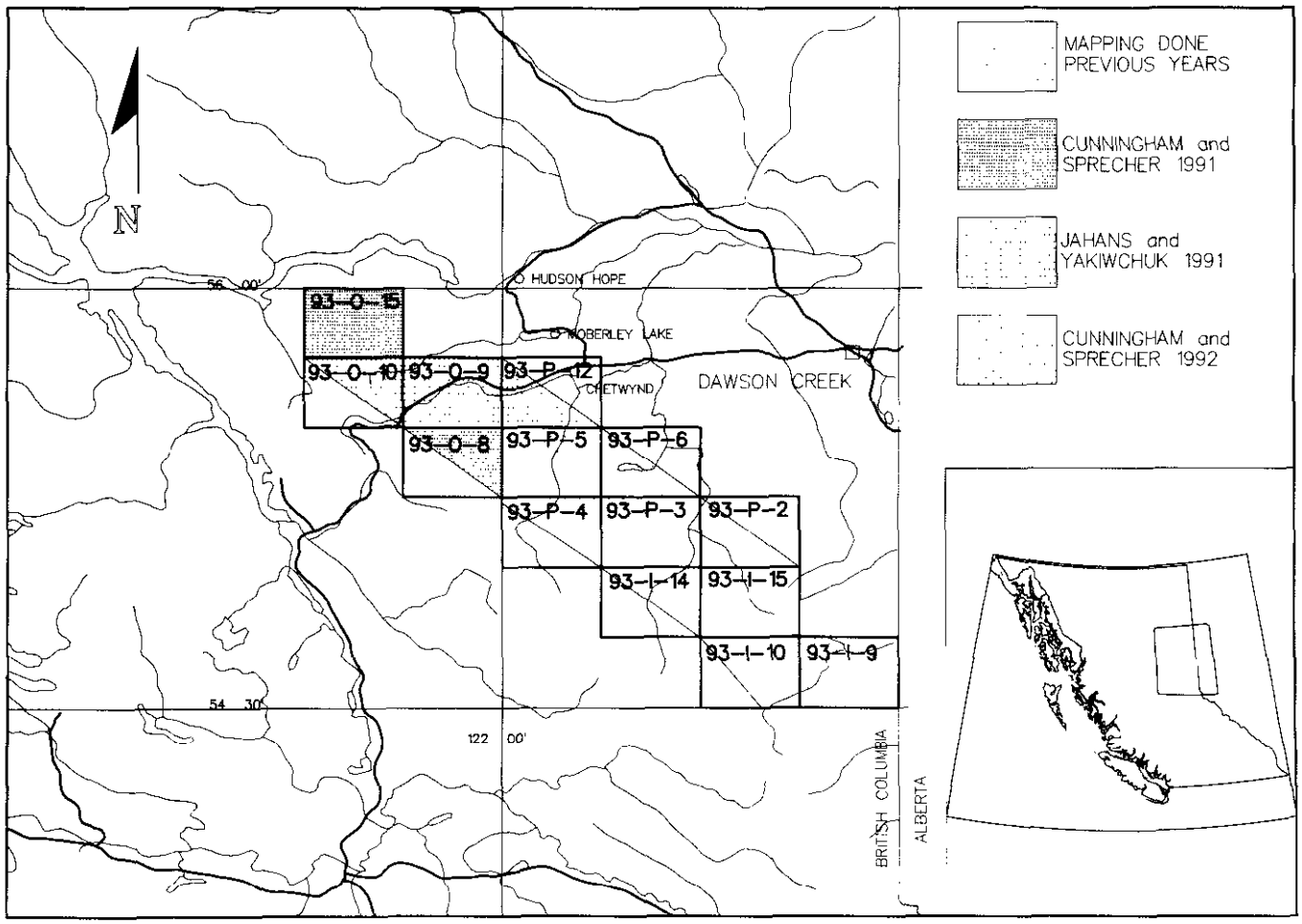

Figure 5-4-1. Location map indicating the area mapped in 1992. Areas mapped in previous years are also shown.

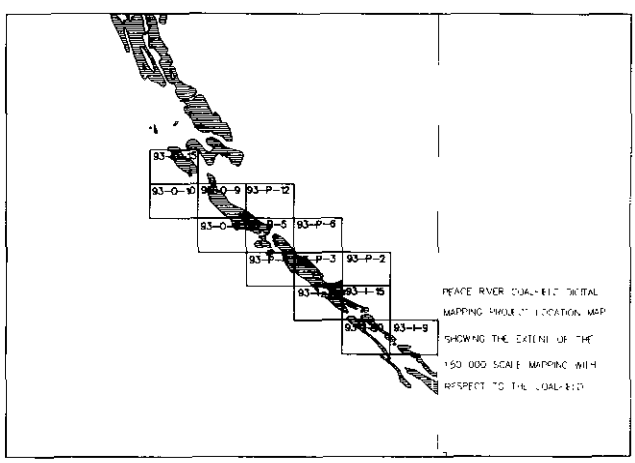

Figure 5-4-2. Map showing location of the Wapiti Lake (93I/10) and Belcourt Creek (93I/9) map areas relative to the Peace River coalfield.

93I. Gilchrist and Flynn's (1978) compilation maps of the Peace River coalfield included the coal-bearing strata in the Monkman Pass area. Detailed mapping of the coal-measures in the Monkman Pass area has been done in previous years by coal exploration companies.

Detailed descriptions of the stratigraphy and structural geology, as well as interpretations of the paleogeography, have been published by Stott (1967, 1968, 1973, 1982) and Hughes (1964, 1967). The Gorman Creek Formation of the Minnes Group in the Monkman Pass area has been described by Stott (1981).

STRATIGRAPHY

Triassic to Upper Cretaceous strata are exposed in the study area. The younger Upper Cretaceous Smoky Group and Wapiti Formation are exposed in the eastern Belcourt Creek map area (Figure 5-4-3). Limited exposures of older Triassic limestones and Jurassic Fernie Formation, as well as Lower Cretaceous rocks of the Minnes Group, are found in the core of the broad, regional-scale Belcourt anticlinorium in the Wapiti Lake map area (Figure 5-4-4). Lower Cretaceous rocks of the Bullhead and Fort St. John groups are exposed in both limbs of the northwest-trending anticlinorium. The western limit of the area mapped is a major fault which thrust Paleozoic carbonate rocks over the southwest-dipping Fort St. John Group. This fault marks the boundary between the Inner Foothills and the Rocky Mountain Main Ranges.

The formations found in the region are summarized in Table 5-4-1. The stratigraphic nomenclature used for the study area is that of the Geological Survey of Canada and is derived from the work of D.F. Stott (1967, 1968, 1973, 1981, 1982). This nomenclature is used to maintain continuity with previous mapping on this project (Kilby and Wrightson, 1987a, b, c; Kilby and Johnston, 1988a,b,c; Kilby and Hunter, 1990; Hunter and Cunningham, 1991a,b; Cunningham and Sprecher, 1992a,b). Previous descriptions of the stratigraphy are quite extensive, and only brief descriptions that highlight variations observed while mapping in various parts of the Peace River coalfield are provided here.

FERNIE FORMATION

The Fernie Formation consists predominantly of recessive, dark grey to black marine shale. Only limited exposures are found in the map area. Most outcrops of the Fernie Formation are found on the small tributary creeks that cut deeply into the overlying Minnes Group strata, in

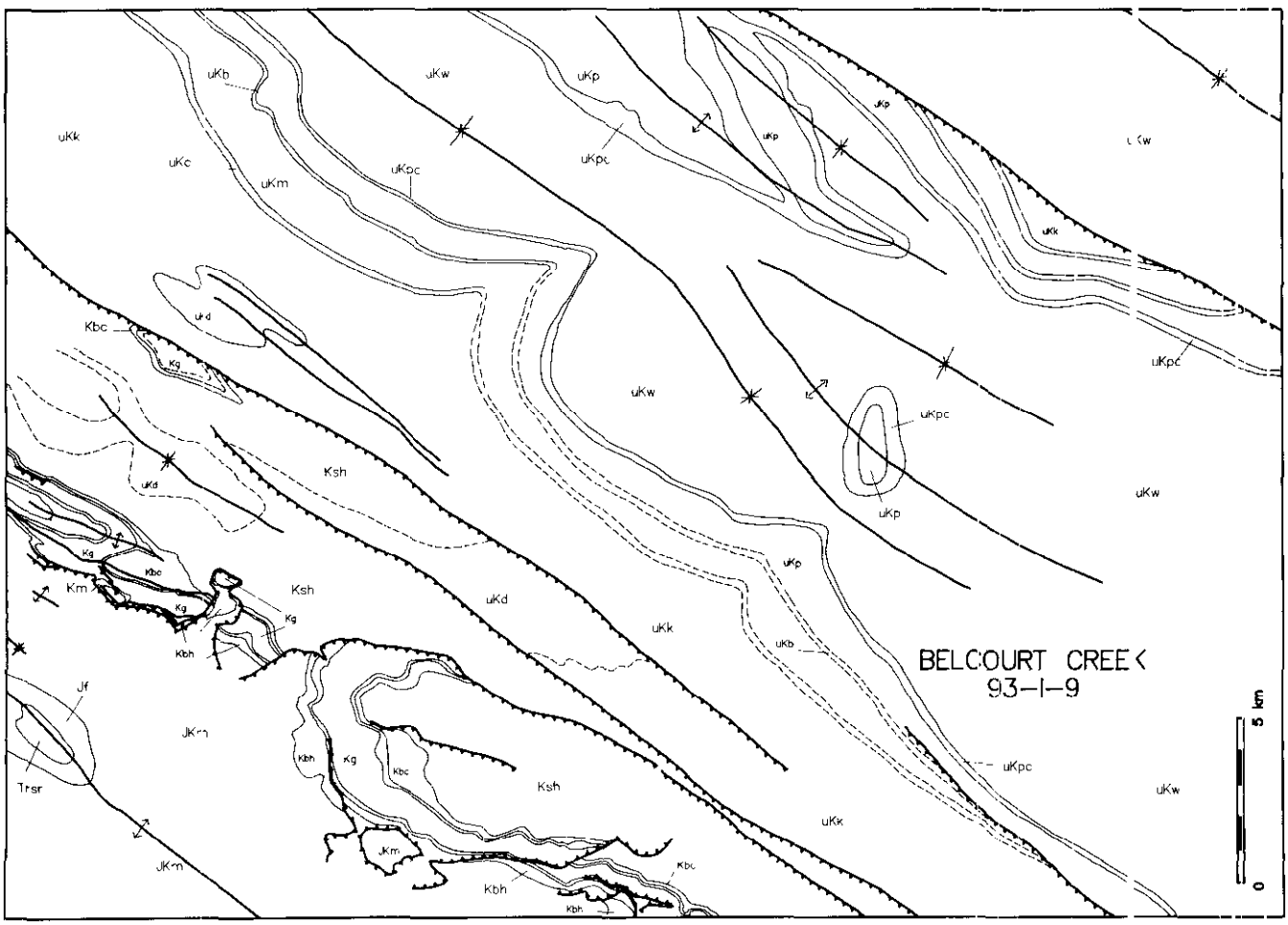

Figure 5-4-3. Preliminary compilation map of the Belcourt Creek map area. *See* Table 5-4-1 for key to map-unit symbols.

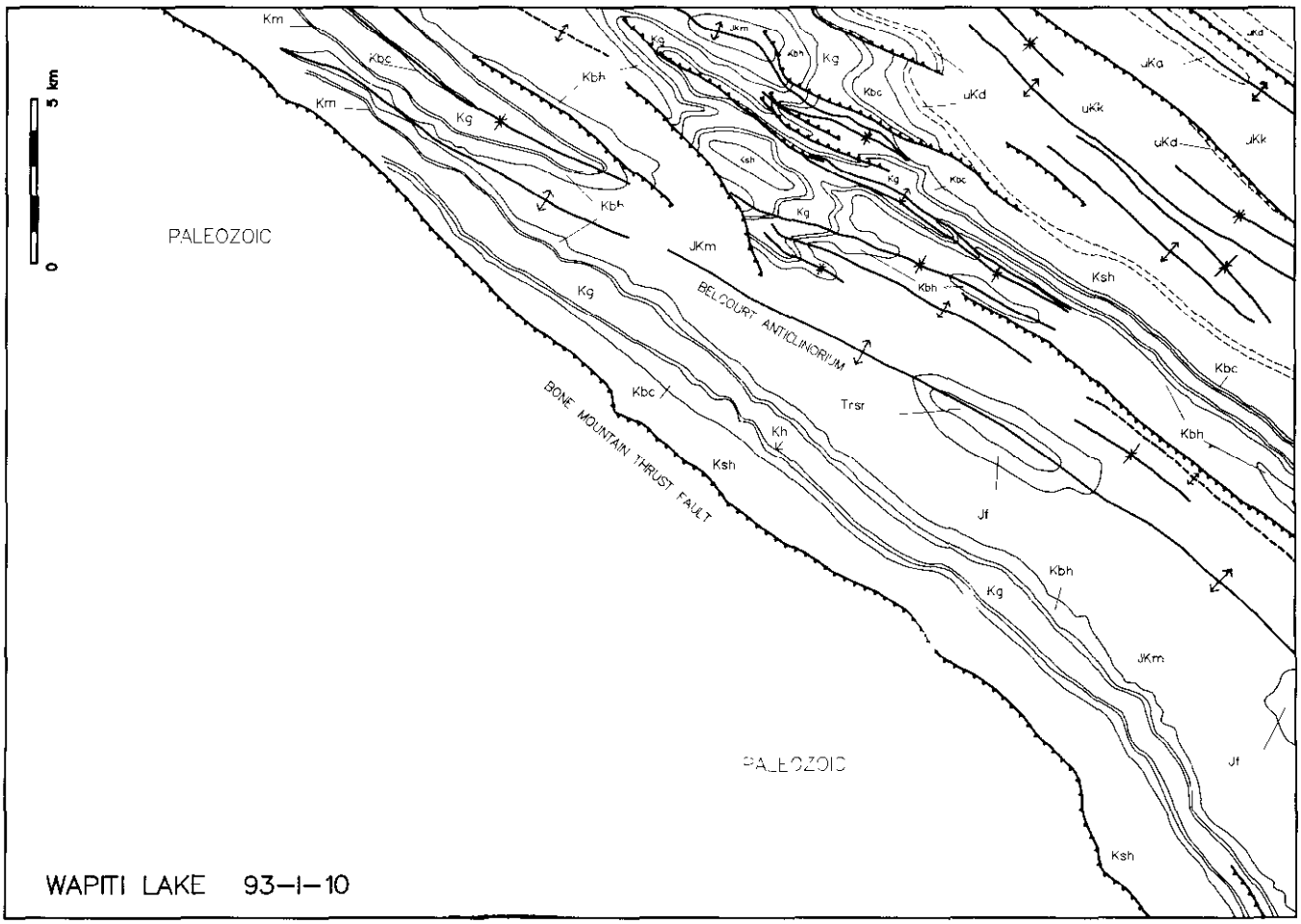

Figure 5-4-4. Preliminary compilation map of the Wapiti Lake map area. *See* Table 5-4-1 for key to map-unit symbols.

the valleys of Red Deer Creek and the Wapiti River, along the axis of the Belcourt anticlinorium.

MINNES GROUP

To the north, from the Pine River to the Peace Canyon, the Minnes Group can generally be divided into four units: the Jurassic to Lower Cretaceous Monteith Formation, and the Lower Cretaceous Beattie Peaks, Monach and Bickford formations (Stott, 1981, 1982). This is the nomenclature used for units in the Minnes Group in the Le Moray Creek map area (93O/8; Cunningham and Sprecher, 1991a,b) and in the Carbon Creek map area (93O/15; Legun, 1988; Cunningham and Sprecher, 1992a, b).

These divisions were not readily recognized in the Burnt River area, west of the Sukunka River (93P/5; Hunter and Cunningham, 1990a, b). The Minnes exposures there consist of interbedded sandstones, siltstones, mudstones, carbonaceous mudstones and thin coal seams and often display complex, mesoscopic-scale folding and faulting. In the Monkman Pass area, the upper part of the Minnes Group appears very similar to the deformed Minnes strata mapped in the Burnt River area.

South of the Pine River, Stott (1981) divides the Minnes Group into two units: the lower Monteith Formation and the upper Gorman Creek Formation. This convention was continued by later workers mapping in the Monkman Pass area (McMechan and Thompson, 1985).

In the Wapiti Lake - Belcourt Creek map areas, the Gorman Creek Formation consists of sandstones, siltstones, mudstones, carbonaceous shales and mudstones, some conglomerates and a few thin coal seams. The Gorman Creek is somewhat similar in appearance to the Bickford Formation, but is considerably thicker. Stott (1981) equates the upper Gorman Creek Formation to the Bickford.

The Monteith Formation consists mostly of brown-grey weathering, resistant sandstones.

Minnes Group strata are generally tree covered and poorly exposed in the northern half of the map area, but are exposed along ridge tops in the south.

BULLHEAD GROUP

The Bullhead Group comprises two formations, the Cadomin and the Gething. In the map area, the Cadomin Formation consists predominantly of grey-weathering, pebble to cobble conglomerate, forming a resistant marker unit some 40 to 50 metres thick. This is similar to the Cadomin mapped in the Burnt River area. In the Le Moray Creek map area, the Cadomin thickens northward to about 250 metres

TABLE 5-4-1
TABLE OF STRATIGRAPHIC UNITS
THICKNESSES GIVEN ARE AVERAGE FOR THE MAP AREA

SERIES	GROUP	MAP KEY	FORMATION	THICK (m)	LITHOLOGY
UPPER CRETACEOUS		uKw	WAPITI	1500	Nonmarine interbedded conglomerate; sandstone; siltstone and coal.
	SMOKY	uKpc	CHUNGO MEMBER	20	Fine-grained, thick-bedded to massive, brown sandstone and grey siltstone.
		uKp	PUSHWASKAU	250	Dark grey to black, rusty weathering marine shale; concretionary. Some calcareous shale in lower part.
		uKb	BAD HEART	25	Fine-grained, brown sandstone; lower part includes siltstone and mudstone.
		uKm	MUSKIKI	65	Grey marine shale; rusty weathering; concretionary.
		uKc	CARDIUM	60	Marine and nonmarine sandstone; may be conglomerate in upper part.
		uKk	KASKAPAU	750	Dark grey marine shales; interbedded sandstone and shale in lower half.
		uKd	DUNVEGAN	150	Marine and nonmarine sandstone; shale and coal; some conglomerate.
LOWER CRETACEOUS	FORT ST. JOHN	Ksh (SHAFTSBURY) uKcr	CRUISER	120	Dark grey marine shale with sideritic concretions; some sandstone.
		Ksh (SHAFTSBURY) Kgo	GOODRICH	190	Fine-grained, crossbedded sandstone; shale and mudstone.
		Ksh (SHAFTSBURY) Kha	HASLER	250	Silty dark grey marine shale with sideritic concretions; siltstone in lower part.
		Kbc	BOULDER CREEK	90	Fine-grained, well-sorted sandstone; massive conglomerate; nonmarine sandstone and mudstone and coal.
		Kh	HULCROSS	20	Dark grey marine shale with sideritic concretions.
		Kg	GATES	280	Fine-grained, marine and nonmarine sandstones; conglomerate; coal; shale and sandstone.
		Km	MOOSEBAR	40	Dark grey marine shale with sideritic concretions; glauconitic sandstone and pebbles at base.
	BULLHEAD Kbh	Kge	GETHING	80	Fine to coarse-grained, brown, calcareous carbonaceous sandstone; coal; carbonaceous shale, and conglomerate.
		Kcd	CADOMIN	40	Massive conglomerate containing chert and *quartzite pebbles and sandstone.*
	MINNES JKm	Kgc	GORMAN CREEK	900	Fine-grained sandstone; siltstone and mudstone; some conglomerate; carbonaceous shale and thin coal seams.
JURASSIC		JKmt	MONTEITH	300	Fine-grained, brown-grey weathering sandstone; minor siltstone and mudstone.
		Jf	FERNIE	200	Calcareous and phosphatic shales; rusty weathering shales; glauconitic siltstone; sideritic shales; and in upper part thinly interbedded sandstone, shale, and siltstone.
TRIASSIC	SPRAY RIVER	Trsr	(UNDIVIDED)	400	Resistant limestone and dolomite; some sandstone and siltstone.

(After Stott 1967, 1981, 1982)

and includes increasing amounts of sandstone and mudstone. Farther north, in the Carbon Creek and Peace River Canyon areas, the Cadomin Formation consists principally of resistant sandstones and is about 250 to 280 metres thick (Stott, 1968; Legun, 1988).

In the Carbon Creek area, the Gething can be over 1000 metres thick (Legun, 1988; Gibson, 1985). To the south in the Monkman Pass region, it is much thinner, averaging about 80 metres thick. It comprises brownish grey weathering pebble to cobble conglomerate, brown-weathering sandstone, siltstone and mudstone and coal. Locally, conglomerate comprises approximately a third of the thickness and isolated outcrops of Gething conglomerate can be difficult to differentiate from Cadomin conglomerate. Only a few coal seams of interest have been noted in the Gething Formation within the map area. Gething coal seams are thicker and more abundant in the Burnt River map area, where the formation was a primary exploration target on coal properties in the area. Significant coal seams are found in the Gething in the Le Moray Creek as well as in the Carbon Creek area.

MOOSEBAR FORMATION

The Moosebar Formation is about 40 metres thick and is generally identified in the field and on airphotos as a recessive, (shaly) unit between the more resistant Gates and Gething formations.

GATES FORMATION

The Gates Formation consists mainly of interbedded sandstone, siltstone and mudstone, conglomerate and coal. Coal seams are up to 15 metres thick in some areas. Carbonacous mudstones are also present, and siltstones and sandstones may contain carbonacous material and woody imprints. The Torrens sandstone is a resistant unit, 15 to 25 metres thick, marking the base of the Gates Formation, which averages about 280 metres thick in the map area.

To the north, at the southern edge of the Burnt River map area, the Gates Formation contains only a few thin coal seams. Further north, across the Burnt River, there is little conglomerate or coal found in the Gates. In the Carbon Creek area, it consists of sandstones, siltstones and mudstones with little carbonaceous material or coal.

HULCROSS FORMATION

The Hulcross Formation is about 20 metres thick in the map area. It is generally recognized as a recessive band of shale between the resistant Boulder Creek and Gates formations. Farther to the south the Hulcross thins to only a few metres thick.

BOULDER CREEK FORMATION

The Boulder Creek Formation consists of light grey weathering pebble conglomerate and sandstone, as well as mudstone, and is approximately 90 metres thick. In the Burnt River area, it is slightly thicker, is dominated by two massive conglomerate units, and contains minor coal seams. In the Carbon Creek map area the formation consists mainly of finer sandstone, siltstone and mudstone.

YOUNGER FORT ST. JOHN GROUP STRATA

Along the foothills northwest of the map area, the Fort St. John Group above the Boulder Creek Formation is readily divided into the Hasler Formation (marine shale), the Goodrich Formation (sandstone, siltstone), and the topmost Cruiser Formation (marine shale). On the eastern limb of the Belcourt anticlinorium, the Goodrich sandstone units grade laterally into shales and the entire shale unit above the Boulder Creek is called the Shaftsbury Formation.

To the south of the Wapiti Lake area, the Goodrich Formation is exposed west of Mount Belcourt and Belcourt Lake, stretching along the western margin of the Inner Foothills (Taylor and Stott, 1979; McMechan and Thompson, 1985). No similar sandstone units are exposed in the map area, so for the present the Hasler, Goodrich, and Cruiser formations have not been differentiated. The recessive unit above the Boulder Creek Formation is mapped as the Shaftsbury Formation. Some sandstone outcrops on the north side of Red Deer Creek that have been exposed since the Red Deer Creek fire in 1987, and exposures along new logging roads on the south side of Red Deer Creek, may prove to be part of the Goodrich Formation.

STRUCTURE

The map area straddles the Inner and Outer Foothills of the Rocky Mountain thrust and fold belt in northeastern British Columbia. Structural elements in the area reflect the regional northwest structural trend.

The plunge of fold axes is generally very shallow. On a regional scale fold axes may undulate gently, with wavelengths of several kilometres as the plunge varies from northwest to southeast and back again along the length of the axial trace.

The Wapiti Lake map area is dominated by the Belcourt anticlinorium. The west limb of the anticlinorium is bounded by the thrust fault marking the boundary between the Inner Foothills and Rocky Mountain Main Ranges, informally called the Bone Mountain thrust fault. Paleozoic carbonate rocks are thrust over the southwest-dipping Fort St. John Group in the west limb of the anticlinorium. The east limb is structurally more complex, with megascopic-scale faulting and folding.

The style of folding varies from east to west. It reflects the transition from the broad, gentle folding and box folds found to the east in the Outer Foothills, to the tighter and more complex folding typical of the Inner Foothills to the west.

The incompetent strata of the Gorman Creek Formation show complex deformation. Tight mesoscopic chevron folds and faults are commonly seen in outcrop. The formation reflects a zone of disharmony. More competent Bullhead Group strata above, and Monteith Formation below, are not as deformed. Propogation of stress through the formations produced varying strain reflecting the competency of the layers.

Most of the faults mapped in the area dip steeply to the southwest. Some faults in the Dokken Creek and Red Deer Creek areas have been incorporated in later folding. For the most part, the Outer Foothills are less affected by faulting,

with most of the stress taken up in large-scale folds. The Inner Foothills contain faulting on all scales, with some of the faults involved in later folding. Most of the faults in the map area are high-angle reverse faults: the most prominent and continuous fault is the Bone Mountain thrust.

ECONOMIC CONSIDERATIONS

Previous Exploration

Most of the coal exploration in the area mapped this summer took place between 1970 and 1985. The important coal horizons are found in the Gates Formation. Exploration was concentrated on two large coal properties, Monkman and Belcourt. In addition, some work was also done on the small Onion Lake property (Figure 5-4-5).

The Belcourt property extended southeastward from the Wapiti River to the Narraway River and the British Columbia - Alberta border, along the east-dipping limb of the Belcourt anticlinorium. The coal licences were originally acquired by Denison Mines Limited in late 1970, and in 1978 Denison and Gulf Oil Canada Limited formed the Belcourt Joint Venture. Earliest exploration on the property was in 1971, but most of the work took place in the middle to late 1970s. The extensive exploration program included detailed mapping, trenching and drilling. Test adits were driven for bulk sampling.

Significant potential reserves were identified, and in 1979 four areas amenable to surface mining were proposed. Two of the proposed pits are in the Belcourt Creek map area: the Red Deer pit, north of Red Deer Creek, and the Holtslander North pit, between Red Deer Creek and Holtslander Creek. The regional reserves calculated for the Red Deer block indicated almost 400 million tonnes of coal in place, with 72 million tonnes accessible by surface mining. (Johnson, 1981). Similarly, over 300 million tonnes of in-place raw coal reserves were calculated to exist in the Holtslander North block, with over 70 million tonnes targeted for removal in an open pit mine (Johnson, 1981). Farther to the south, two smaller pits were proposed on either side of Flume Creek with combined reserves of about 43 million tonnes (Johnson, 1981). Coal outside these areas was targeted for possible underground mining. By 1980, the focus of the project had shifted to the two proposed pits near Red Deer Creek, with a preliminary feasibilty study done to examine the existing and proposed infrastructure necessary for a mine. However, this was the last year any work was done on the Belcourt Property. None of the proposed open-pit mines were considered feasible due to economic considerations at the time.

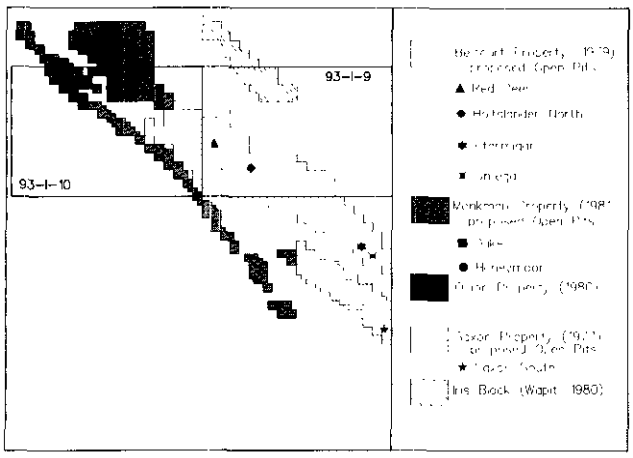

Figure 5-4-5. Map showing the various coal properties in relation to the Peace River coalfield and the areas mapped in 1992.

The Petro-Canada Limited Monkman property extended southeastward in a narrow string of licence blocks from the area of Bone Mountain to Nekik Mountain, following ridges underlain by southwest-dipping Fort St. John and Bullhead Group strata on the west limb of the Belcourt anticlinorium. Two other major licence blocks were held covering coal-bearing strata in the Five Cabin Creek - Onion Creek area, and from Honeymoon Creek south to the Wapiti River. Exploration was carried out on the property by Petro-Canada on behalf of its other partners, Canadian Superior Exploration Ltd. and McIntyre Mines Ltd. McIntyre and Canadian Superior had done much of the initial work in the early 1970s. Most of Petro-Canada's work in the late 1970s and early 1980s concentrated on the Duke Mountain Block near Honeymoon Creek, north of the Wapiti River map area. In 1980, two open-pit mines, the Honeymoon and the Duke pits, were proposed and detailed mapping, trenching, drilling and structural interpretations helped to outline the extent of the coal deposit. Measured coal reserves calculated for the Honeymoon and Duke areas were 237 million tonnes and 146 million tonnes, respectively (Petro-Canada Coal Division, 1981). A third possible open-pit mine site was identified to the southwest of the Duke pit. Although by the mid-1980s it was apparent that significant reserves were indicated, mine development was uneconomic under prevailing market conditions.

The Onion Lake property was a small block of 5 licences acquired by Shell Canada Resources Ltd. in 1979 and operated by Crows Nest Resources Ltd. The property was located at the headwaters of Onion Creek, sandwiched between the south end of the Monkman property Onion Creek licence block on the east and the Rocky Mountain Main Ranges fault on the west. The property was relatively inaccessible with little outcrop. The exploration program was limited to mapping the licences and some of the surrounding area, and the drilling of two holes. Based on the results of this work, the licences were surrendered in the mid-1980s.

Gulf Canada Resources' Iris block in the Wapiti property extended as far south as the Wapiti River, but most of the interest was in coal in the Wapiti Formation on the Kaskatinaw block, farther to the north. Only a few holes were drilled and limited mapping was done in the Iris block.

Coal Occurrences

The only producing coal mines in the Peace River coalfield are at Bullmoose and Quintette. Both are open-pit mines that are exploiting coal seams in the Gates Formation. The Gates seams are mostly medium-volatile bituminous

metallurgical coal. Oxidized coal is sold as thermal coal (Grieve, 1992).

Minor coal seams occur in several of the formations in the Monkman Pass area, but the principal coal-bearing strata are the Gorman Creek, Gething, and Gates formations; Wapiti Formation coal seams are mined in Alberta. In this area, only the Gething and Gates formations contain coal seams of potential economic interest, and it is the Gates which is the most promising.

Most of the Wapiti Formation coal seams in the map area are thin and of little interest. One thicker and relatively continuous seam is at the base of the formation, just above the resistant Chungo sandstone of the Puskwasau Formation. This 2-metre seam attracted some interest by Gulf Canada Resources on the Wapiti property farther to the north.

The coal seams in the Gorman Creek Formation are typically less than a metre thick. They are discontinuous, and the formation is often strongly deformed, making it very difficult to trace and correlate seams. The coal in the Gorman Creek has not yet proved to be of economic interest. Minnes coal ranks generally range from high to low-volatile bituminous in the Peace River coalfield. Minnes coals sampled on the Monkman property are low-volatile bituminous (Wright, 1981).

Coal in the Gething Formation is of more interest. Seam thicknesses vary, many are thin and discontinous, but seams of possible economic significance have been noted. In the north part of the Wapiti Lake map sheet area, Gething coal may be up to a metre or two thick. In the south of the Belcourt Creek map area, seams range from a few metres to several metres thick. However, the number of thicker seams appears to decrease from north to south within the map area. Gething coals vary from medium to low-volatile in the area (Petro-Canada Coal Division, 1981).

The most important coal deposits in the region are in the Gates Formation. It contains several major seams and up to thirteen coal zones. Not all of these zones are continuous or potentially mineable. Thicknesses of the coal vary from a metre to several metres, and in some cases two or more closely associated seams form a coal zone. As many as five of these seams have been evaluated for by exploration companies. Gates Formation coals vary from high to low-volatile rank, but in the Monkman Pass area are mostly medium to low volatile (Gormley, 1977; Denison Mines Limited, 1979; Johnson, 1981).

Most of the coal horizons in the Gates Formation, and to a lesser extent the Minnes Group and Gething Formation, have been extensively sampled in drill-core, trenches and adits. For this reason, and because of a short field season, our sampling program was limited. Only a few samples of Minnes and Gates coal, as well as samples from thin seams in the Dunvegan and Bad Heart formations were collected, most in very shallow hand trenches. Samples were prepared and analyzed using methods outlined by Kilby (1986, 1989). Detailed analysis of the results has not been completed, but preliminary results indicate coal ranks fall within expected ranges.

Proposed Provincial Parks And Additions

"Parks and Wilderness for the 90s" is a cooperative program of BC Parks (Ministry of Environment, Lands and Parks) and the Forest Service (Ministry of Forests). As part of this initiative, the provincial government is proposing additions to various parks and recreational areas, as well as creating some new parks.

Additions have been proposed to Monkman Park and the Kakwa Recreational Area. A decision on these changes is planned for 1995. As well, a new park is proposed for the Belcourt Creek region; a decision will be made by the year 2000. Although the proposed boundaries are subject to revision during the planning process, the areas that have been designated for the Kakwa Addition and the new Belcourt Park include parts of the Peace River coalfield where potential coal reserves have been identified (Figure 5-4-6).

The proposed additions to the Kakwa Recreational Area would include the southern tip of the coalfield. The Saxon property, acquired by Saxon Coal Limited in late 1970, extended south from the Belcourt River to the Torrens River. The area was explored and drilled in the 1970s by Denison Mines Limited. In the middle to late 1970s, potential coal reserves were identified in two areas on the property. In the Saxon East block, calculations indicated reserves of 162 million tonnes of in-place raw coal (Jordan, 1977). Development of an open-pit mine was proposed on the Saxon South block between the Torrens River and Saxon Creek. Indicated reserves available to surface mining were calculated at 71 million tons of in-place raw coal (Jordan, 1977). A feasibility study was completed to assess the needed infrastructure to support a mine. As was the case for most of the mine development plans in the northeast at this time, economic considerations precluded mine development and continue to do so.

The proposed new Belcourt Park straddles the border of the Belcourt Creek and Belcourt Lake (93I/8) map areas, and also includes part of the southern Peace River Coalfield.

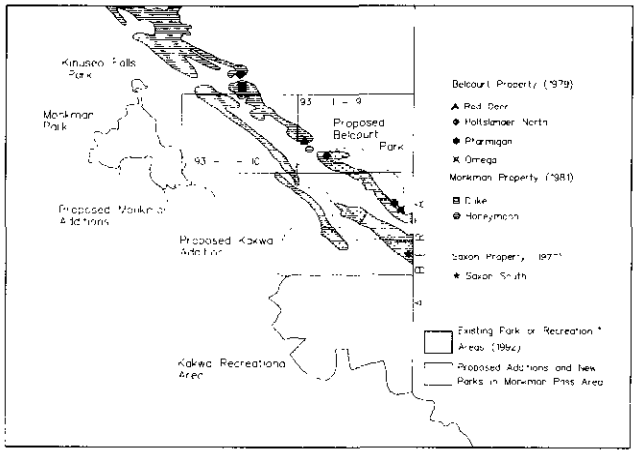

Figure 5-4-6. Map showing the boundaries of the proposed additions to Monkman Park, Kakwa Recreation Area and Belcourt Park.

This area was part of the Belcourt property explored in the 1970s and includes areas where open-pit mines were planned.

Future Considerations

COAL EXPLORATION

Most of the coal-bearing strata in the northeast have been mapped piecemeal by various exploration companies at detailed scales, and several potentially economic deposits have been identified in the Monkman Pass area. However, present economic conditions do not encourage the development of these deposits. As a result, there has not been significant coal exploration in the area for several years.

COALBED METHANE

The high to low-volatile bituminous rank of the coals and the number of coal seams in the Peace River coalfield would make this area attractive for coalbed methane exploration. Thick coal zones in the Gates Formation might provide one source. Strain in response to the deformational stresses associated with the formation of the Rocky Mountains might provide increased permeability within coal seams. Coalbed methane production could provide a way to exploit coal which is too deep to mine.

The cold winters in the northeast could complicate water disposal from coalbed methane wells. This is an obstacle that would have to be overcome even if the geological factors are favourable. At present, there is little demand for coalbed methane in Canada, but as economic conditions change and the recovery technology improves, the coalfield may provide potential sites for coalbed methane production.

PARKS AND OTHER PROTECTED AREAS

Some of the most significant coal deposits in the southern Peace River coalfield are within the proposed boundaries for Belcourt Park and the Kakwa Addition. Although the mines that were proposed during the 1970s and 1980s could not be developed under current economic and market conditions, it is possible that in the future it will become feasible to develop these deposits. As well, the potential for coalbed methane production in this area should also be considered.

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