# Report
# on a Geological Reconnaisance
# over
# Issued Coal Licences
# from
# "Chauncey" Ridge to Ewin Pass,
# Elk Valley Coalfield

Victoria
October 1977

## Précis

A geological reconnaisance over issued coal licences from "Chauncey" Ridge to Ewin Pass in the Elk Valley Coalfield was undertaken in August 1977. The study was initiated in response to the Fish and Wildlife Branch's request for a cancellation of these licences.

On the basis of this work, the size of the coal resource is estimated to be in excess of $7.5 \times 10^8$ tons. Of this approximately 50 million tons can be regarded as measured reserves.

The value of exploration done on the licences to date, in 1977 dollars, is in the order of $300,000; one quarter million dollars has been spent on Ewin Pass alone.

Coal quality at Ewin Pass is known to be very good. Further to the north at Imperial Ridge, "Todhunter" Ridge and "Chauncey" Ridge, on the basis of extrapolation and increased rank, it is anticipated that similar or better quality coals exist.

Only one area is considered to offer any immediate open pit potential. Other areas examined are thought to show varying degrees of underground, room and pillar and/or hydraulic potential.

The Ewin Pass location represents a potential open pit site of approximately 207 acres (less than 1/3 square mile) in the total licence area involved which is about 30 square miles. All other potential mine sites are seen as underground developments that will cause a minimum of environmental disturbance to the high elevation grasslands.

## Introduction

In response to a request by the Fish and Wildlife Branch, Ministry of Conservation, requesting cancellation of coal licences in Chauncey, Todhunter and Ewin Creeks a reconnaisance geological survey was conducted in August 1977 to gather data preparatory to a reply. These data have now been assembled and form the basis of this report.

The contents of the Report are listed below:

A) Licences

The area outlined in red on Appendix Map 1 is that over which the Fish and Wildlife Branch seek cancellation of licences. The licencees and the licence numbers below differ slightly from the original list supplied by the Fish and Wildlife Branch.

Shell Canada Resources Ltd.
(Crowsnest Industries Ltd.) C.L. 6731 - 6733
6735 - 6738
6741 - 6742
6748 - 6758
6760 - 6762
6783
Part of 6765, 6766

Amendment C.L. 6759 (omitted from original request).

Kaiser Resources Ltd. C.L. 6743, 6744
6746, 6747

Amendment C.L. 6745, although included in the original request, is not owned by Kaiser Resources Ltd., and is outside of the area considered by the Fish and Wildlife Branch.

Canpac Minerals Ltd. C.L. 6728

Amendment Only part of C.L. 6729 should be included in the request.

B) Development on the Licences

The submission by the Fish and Wildlife Branch contains the following description of development prior to 1974: - "Exploration involving minor trail construction

(C.N.I. licences 6753 and 6758) on the south end of Ewin Ridge and on Kaiser licences 6746 and 6747 in Ewin Valley".

This is incomplete. The following is an accurate description of the work done and the cost involved.

Crowsnest Industries Ltd.

In 1970 Crowsnest Industries Ltd. undertook a surface exploration programme at Ewin Pass that included geological mapping of an 8 square mile area, five miles of road construction and drilling and geophysical logging of 9 rotary drill holes totalling 7,750 feet. Laboratory work on washed coals included chemical assay by A.S.T.M. methods on 37 coal samples representing 5 correlatable coal seams. Characterization of coking properties by A.S.T.M. methods and petrographic analysis was done on four of the seams.

The cost of this work in 1970 was $150,000.

North of Todhunter Creek, four adits have been driven into coal seams that are considered to be the northern equivalents of the Ewin Pass seams. The value of this work in 1977 dollars would be $12,000.

Kaiser Resources Ltd.

Reconnaisance geological mapping has been done on the southern two licences. In addition, nine adits have been driven for bulk samples for carbonization tests. The value of this work in 1977 dollars would be $27,000.

C) Areas with Mining Potential

For the purposes of this study, areas considered to possess mining potential are those with thick (>10 feet) continuous seams, uninterrupted by block faulting, yet with a maximum of 2500 foot cover. Five areas have been delineated and of these only one is considered to be a suitable open pit site. The remaining areas are thought to be potential underground sites if they are regarded by the companies as economically viable. The five areas are indicated on the accompanying Appendix Map 1, and are discussed separately below.

1. Ewin Pass

There are four principal seams of interest at Ewin Pass which are identified in decreasing order as 4, 5, 7 and 8. A fifth seam No. 6, occurs only at the south end of the property.

These seams are the northern continuation of seams located on C.N.I.'s Line Creek property.

A cross-section (fig. 1) indicates immediately the open-pit potential of this site.

To assess the value of this property, two calculations were performed.

(i) Size of coal resource

In-situ tons of coal are calculated using the following formula.

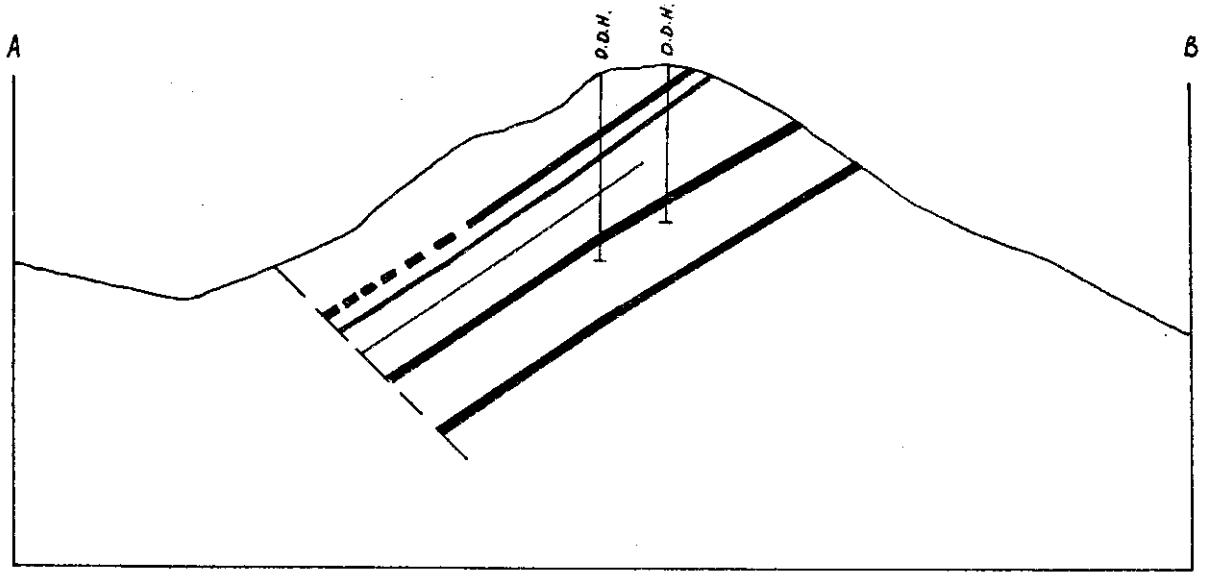



FIGURE 1

CROSS-SECTION EWIN PASS DEPOSIT (COURTESY C.N.I)

SCALE 1 : 12 000

$$\frac{1800 \times B \times C}{\text{cosine } D}$$

where B is the thickness of the coal seam

C is the area, in acres, underlain by the coal seam, and

D is the attitude of the seams.

For the Ewin Pass area, the calculation considered only that area east of Ewin Ridge Thrust and the Alexander Creek Syncline, on licences south of C.L. 6754, 6753.

The parameters used were:

B = 155 feet
C = 1459 acres
D = $30^{o}$

Total coal resource = 470,031,060 tons.

(ii) Size of measured reserves

Size of individual seam reserves, Ewin Pass

TABLE 1

| Seam | Thickness (feet) | Area (acres) | Tons of coal |
|---|---|---|---|
| 4 | 35 | 161 | 10,192,316 |
| 5 | 10 | 134.8 | 2,426,742 |
| 6 | 10 | 87.3 | 1,571,604 |
| 7 | 55 | 231.9 | 22,965,454 |
| 8 | 30 | 239.6 | 12,942,624 |

Total possible reserve = 50,098,740 tons

## 2. Imperial Ridge

Coal Licences bisect Imperial Ridge; the southern part is held by Kaiser Resources Ltd., and the northern part by C.N.I. (Shell Canada Resources Ltd). For the immediate future this will serve to limit exploration.

The setting is such that the long axis of the ridge forms a large acute angle with the strike of the coal seams. Thus an open pit appears to be unworkable because of high stripping ratios. However total coal thickness of 112 feet, together with three seams greater than 18 feet thick suggest a possible room and pillar or hydraulic-mine site.

Seams B, C and D probably correlate with seams 10B, 8 and 7 of Ewin Pass (see fig. 2), and hence high quality coal can be anticipated. Petrography done in the Ministry of Mines Coal Laboratory indicate Mean Maximum Reflectances of 1.30 , 1.26 and 1.17 for the three seams of interest, which are comparable with Ewin Pass coals.

Two calculations were done for the area.

(i) Total coal resources between Todhunter and Ewin Creeks

$$\text{Total Resource} = \frac{1800 \times B \times C}{\text{cosine } D}$$

B = 112 feet
C = 640 acres
D = $30^{\circ}$

Total Coal Resource = 148,983,290 tons.

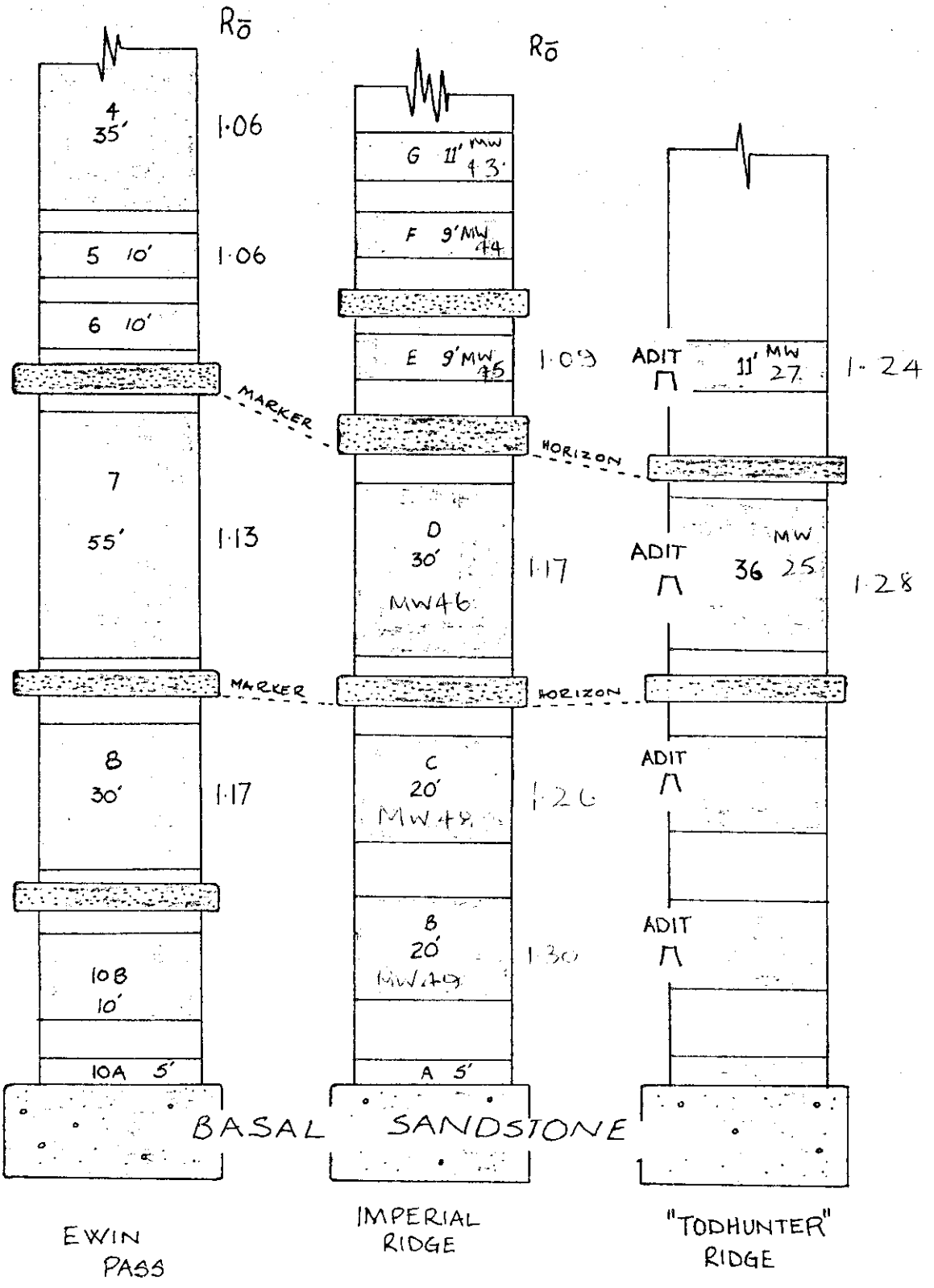
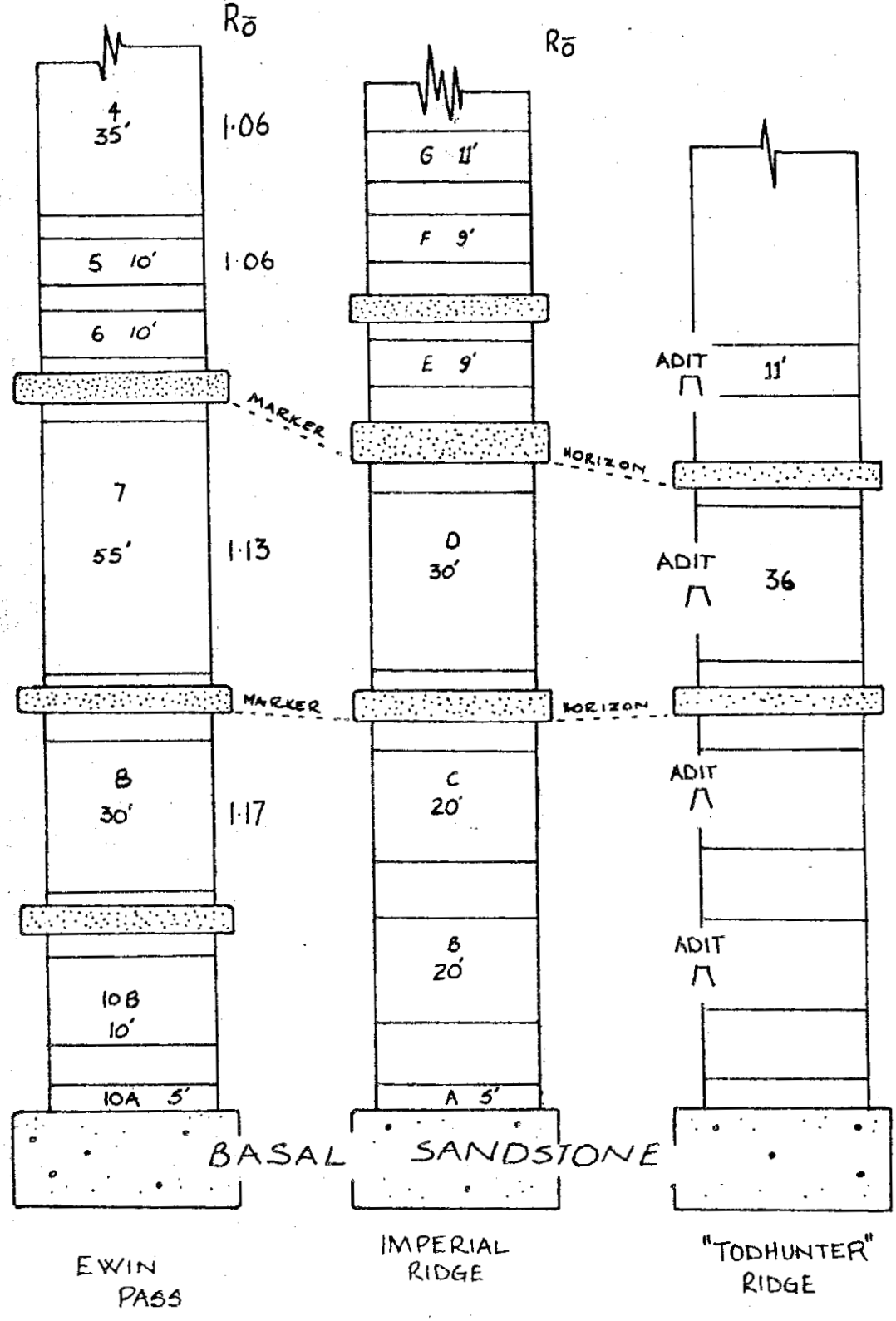



FIGURE 2

Correlation of Ewin Pass coal seams with those of Imperial Ridge and "Todhunter" Ridge.

$R\bar{o}$ is a microscopically derived indication of coal rank; values above 1.12 indicate medium volatile bituminous coals, those below 1.12 are high volatile bituminous coals.

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(ii) Potential Resource of seams B, C and D

B = 68 feet
C = 213 acres
D = 30°

Total potential Resource of the three seams = 30,104,268 tons.

3. Todhunter Ridge

Reconnaisance mapping over "Todhunter" Ridge located a large coal seam sandwiched between two prominent sandstones, a situation reminiscent of Imperial Ridge. On this basis and the correlation of ranks determined petrographically in the Ministry of Mines Coal Laboratory, a reasonable correlation exists between "Todhunter" Ridge and Imperial Ridge (fig. 2).

The coal measures occupy a scarp situation with a general westerly dip of 30 degrees. Unfortunately the thicker seams outcrop too far down the scarp face to make an open-pit economically viable. Any development here would almost assuredly be underground.

For the purposes of a coal resource calculation a total coal thickness of 60 feet was assumed. This is reasonable in that 47 feet of coal was measured and there are at least three lower seams that were not visited (these were seen later from a helicopter). The area for which the coal resource was measured is from the 5400 foot level in Chauncey Creek to the same level in Todhunter Creek along the strike of the upper seam.

$$\text{Total resource} = \frac{1800 \times B \times C}{\text{cosine } D}$$

B = 60 feet
C = 630 acres
D = $30^{\circ}$

Total Resource = 78,565,400 tons.

4. "Chauncey" Ridge

This area was not ground checked, but aerial reconnaisance indicates its similarity to Todhunter and Imperial Ridge. The area has a homoclinal slope that does not appear to lend itself to an open pit situation.

$$\text{Total resources} = \frac{1800 \times B \times C}{\text{cosine } D}$$

B = 60 feet
C = 430 acres
D = $30^{\circ}$

Total Resource = 53,624,008 tons.

5. Ewin Ridge

Nine adits at the north end of Ewin Ridge expose 60 feet of coal that occurs on a thrust separated sheet to the west of that which contains the Ewin Pass to "Chauncey" Ridge sequence. The westerly dipping coal measures are overlain by a very thick pile of non coal-bearing rocks which preclude open-pit potential for this area. The thickest seam exposed is only 17 feet, so unless it is of superior quality, it is doubtful that much more exploration would be done here.

The quality of the coal is not yet known.

Coal resources have not been computed for this area.

D) Coal Quality

Definitive coal quality information is only available from four seams at the Ewin Pass site, but it is probable that Imperial Ridge and "Todhunter" Ridge possess similar quality coals.

The coking power of coals from Ewin Pass is superior to that of Line Creek and Fording River coal, at similar volatile matter content. According to the A.S.T.M. classification all four seams are medium volatile bituminous, but based on the mean maximum reflectance of the vitrinite maceral the upper two are high volatile coals (table 2).

TABLE 2

| Seam # | 8 | 7 | 5 | 4 |
|---|---|---|---|---|
| Volatile content (d.m.m.f.b.) | 24.7 | 28.6 | 29.1 | 29.1 |
| F.S.I. | 4-5 | 8 | 8 | 8 |
| Mean Reflectance | 1.17 | 1.13 | 1.06 | 1.06 |
| Calculated coke stability | 44.0 | 52.1 | 54.4 | 54.4 |

The coals are regarded by the Japanese as excellent blending coals and are described in the 1975 Tex Report (Coking Coal Manual) as follows. "Should the

coal of Ewin Pass area, which is higher in quality (than the Line Creek area) be blended with them, free swelling index will further increase, eventually making it possible to ship high-grade hard coking coal."

E) Conclusions

During the reconnaisance survey, the sheer beauty of the area impressed all members of the crew. Similarly, the use of the area by wild animals is equally obvious. While we saw no game, never have I seen so much deer and sheep dung in such a small area. I cannot doubt therefore that this is an important environment for the wild life of the Elk Valley.

Equally apparent is that there are large volumes of coal in the area. The estimated size of the resources is in excess of $7.5 \times 10^8$, which is a staggering amount of coal. More important is the fact the $5 \times 10^7$ tons, worth $55 per ton at todays price, are virtually proven reserves.

Fortunately a compromise position exists. I believe the coal companies must be allowed to evaluate the potential of the land which they hold. This can be accomplished in a way that will facilitate minimum environmental damage. Only then will the true perspective of this area be realized, which is that economically, this is not a prime target for open-pit coal development.

Underground operations in the area would not seriously damage the upland grazing pastures to the extent some people have envisaged.