

# ESSO RESOURCES CANADA LTD. (E.R.C.L.)

B.C. RECONNAISSANCE REPORT

PHASE I : HAT CREEK/MERRITT/SILKAMEEN (NICOLA AND PRINCETON AREAS) 92H, 92I PHASE II : BOWRON TREND

93B, 93G PHASE III: FRASER RIVER TREND 93G, 93H, 93I

1982 PROGRAM

H.E. HOPKINS

WAY 1 - COMPLETE



BRITISH COLUMBIA

BITUMINOUS RECONNAISSANCE PROGRAM

SUMMER - 1982



BY: HAROLD E. HOPKINS

MEMORAN	
85 09 25	/
TO:	Jim Allan
FROM:	Brenda Wright
SUBJECT:	NECHAKO RECONNAISSANCE SAMPLE GUESS CREEK SAMPLES

Please perform mean reflectance on the enclosed samples:

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Guess CreekSta #1Sample 1Sta #1Sample 2Sta #1Sample 3Ashton MullenSample #1 (Carb. mdst.)NechakoNOOl

The first four samples were taken from middle Jurassic Hazelton Group sediments northeast of Smithers, B.C. The Guess Creek samples were found in close association with intrusive igneous rocks, so I would expect them to be upranked. We do not know much about the Ashton Mullen sample area - it all looked marine except for this one spot.

The Nechako sample is from an outcrop which was visited last year by John Dunn. It was analyzed as being a high-rank anthracite (Mean Refl 5.64%) by yourself last year (File 2647-Letter No. 45139). This is the only coal occurrence found in a series of coarse clastics with interlayered igneous rocks. We would like to double check the rank on this sample.

In addition, we would like to have proximate analysis, calorific value and total sulphur run on each sample. The charge code for this work is Al-YAO4.

Deadline - October 31

Thank you.

Brenda.

BMW:jlb 0027k:55 xc: J. Horgan File 93F/7 File 93L/15

### ACKNOWLEDGMENTS

The following report is based upon the field approach of the writer with supervision by A. Peach.

R. Berg and the writer were assisted in the field by L. Goldberg and D. Howard. The advice of A. Peach and the assistance of R. Berg were both greatly appreciated while generating the text.





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### INTRODUCTION

The province of British Columbia contains a number of distinct coal basins, most of which have been known for over a century, with most of the data being collected between 30 and 70 years ago. Except for the northeast and southeast coal blocks, all the coal basins seem isolated and unrelated. The lack of a geological trend, unlike the Foothills trend, coupled with a deficiency of up-to-date data, has discouraged a systematic search for undiscovered coal resources on a regional scale.

The procedure for the past summer's reconnaissance was two-fold. First, general depositional models which honoured all available data had to be generated. These models were then applied to particular areas of interest to designate viable targets which could be investigated in the field. The methodology used to design the 1982 reconnaissance program is shown in Figure 1.

The areas investigated were chosen because of the number of known coal occurrences in the vicinity (Figure 2). The abundant infrastructure would increase economical potential in the event coal was found by providing markets and transportation. Finally, the abundance of access roads and living facilities helped maintain a reasonably low operations budget.

No previously unmapped coal was found, however, the program did succeed in revealing several sedimentary sequences where Eocene volcanics existed. These finds greatly increase the validity of the untested depositional models derived for this reconnaissance program. The program was also a success in that it essentially eliminated approximately 55,000  $\rm km^2$  of British Columbia from being economically coal bearing, and drew attention to one area where moderate coal potential exists.

LOGY METL







FIGURE 2

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### PHASE I

### LOCATION

The Phase I targets are located in south-central British Columbia west of the Okanagan Valley with the towns of Kamloops, Merritt and Princeton forming a central north-south axis through the search area. Map sheets 92H-W 1/2 and 92I cover this first reconnaissance phase.

### REGIONAL GEOLOGY

The Phase I area, on a regional scale, is bounded on the east by the Omineca Crystalline Belt and on the west by the Coastal Intrusions. The prevalent rock units in the area include the Upper Triassic Nicola Group which is a low to medium grade metamorphic complex, the Jurassic granitic Coast Intrusions and the Miocene (or older) basic to midrange volcanics called the Kamloops Group in the north, and the Princeton Group in the south. For a more complete geological breakdown see Table 1 which compares the geological units of the three G.S.C. geology maps which cover the Phase I area.

The coal measures include the Princeton Group, the Tranquille Beds of the Kamloops Group and the Coldwater Beds. These units were dated by the G.S.C. as Miocene or older with the Coldwater Beds lower in the section (Rice, 1944; Cockfield, 1943; Duffel and McTaggart, 1947). Later palynogical studies set the age of these beds at Middle Eocene (Graham and Long, 1979). The relative ages of these sequences are still highly contested, however a discussion of this nature is too academic for the purpose of this report. It is sufficient to state that the Princeton and Tranquille Beds are roughly equivalent in age and occur with associated volcanics, while the Coldwater Beds are slightly older and have no related volcanic rocks, with the exception of the Hat Creek deposit.

The structural geology includes mild deformation which has resulted in folding and minor faulting within the coal measures. A majority of this faulting appears to have origins related to sediment settling and volcanism (Plate 1 - Tulameen Test Pit).



Plate 1 - Tulameen Test Pit showing characteristic faulting style found in Phase 1 area.

ERA	PERIOD OR EPOCH	GROUP OR FORMATION	GROUP OR FORMATION	GROUP OR FORMATION	LITHOLOGY	
	MIOCENE OR YOUNGER		Unnamed	Unnamed	Valley başalt	
ľ			Unnamed		Plateau basalt	
	MIOCENE OR	Kamloops Cp.	Kamloops Gp.	Princeton Gp.	Varicolored, andesite, basalt	
10	OLDER		Kamloops Gp. (Tranquille Beds)	Princeton Gp.	Shale, sandstone, conglomerate, coal	
CENOZO	MICCENE OR OLDER	Coldwater Beds	Coldwater Beds		Sandstone, shale, conglomerate, coal	
	EOCENE	Unnamed			Conglomerate, breccia, arkose, shale	
	CRET. OR TERT.		Copper Creek Intrusion	Otter Intrusions	Granite, granodiorite	
	CRET. OR TERT.		Unnamed		Andesite, basalt, agglomerate, breccia, tuff	
	CRET. OR TERT.	Unnamed			Conglomerate, sandstone, shale	
	L. CRET.	Kingsvale Gp.	Kingsvale Gp.	Kingsvale Gp.		
	L. CRET.	Unnamed	· · · · · · · · · · · · · · · · · · ·		Granodiorite	
	L. CRET.	Spences Bridge Fm.	Spences Bridge Gp.	Spences Bridge Fm.	Hard, reddish andesite, basalt	
	L. CRET.	Jackass Mtn. Fm.			Greywacke, argillite, arkose, conglomerate	
	L. CRET.	Lillooet Gp.			Argillite, quartzite, conglomerate, tuff- aceous sandstone	
	L. CRET.	Brew Gp.			Argillite, quartzite, conglomerate	
2010	JUR(?), CRET.			Dewdney Ck. Gp.	Tuff volcanic breccia, grit, argillite	
MESO?	L. JURASSIC			Copper Mta. Intrusions	Syengabbro, augite diorite, pegmatite	
	M.TO L. JURASSIC	Unnamed			Shale, congolomerate, sandstone	
	JURASSIC JURASSIC	Guichon Creek	Coast Intrusions	Coast Intrusions Unnamed	Granite, granodiorite, diorite, gabbro Peridotite, pyroxenite, gabbro	
	TRIASSIC	Nicola Gp.	Nicola Gp.	Nicola Gp.	Basalt, andesite, limestone, quartzite, argillite, greywacke	
	TRIASSIC PERMIAN	Unnamed			Phyllite, quartzite, greenstone, argillite, slate, schist	
		Unnamed			Schist & gneiss	
PALEOZOIC	CARBONIFEROUS AND PERMIAN	Cache Creek Gp.	Cache Creek Gp.		Argillite, greenstone, limestone, quartzite conglomerate, schist	
	CARBONIFEROUS OR YOUNGER			f f f f Bradshaw Independence Shoemaker Old Tom Formations	Argillite, andesite, limestone, schist, gneiss	
				Hozameen Cp.	Chert, andesite, limestone	
	(Fr: Duffel and ( Fr: Cockfield, (Fr: Rice, 1939, McTaggart, 1945-46) 1948) 1941, 1944)					

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### PHASE I - REGIONAL GEOLOGY OF THE PRINCETON, NICOLA & ASHCROFT AREAS

TABLE 1

### SEDIMENTARY MODELS

The varying character of the coal deposits in this area made it necessary to derive a number of models.

Model A - Eocene Sediment Influx into Topographic Lows

This model was derived using the Merritt and Quilchena deposits as basic models and best explains the origin of the Coldwater Beds (Figure 3).

The rising of the Coastal Intrusions during Jurassic time caused differential upward pressure on the overlying Triassic strata resulting in its metamorphism and deformation into topographic highs and lows. Erosion would enhance any resulting basins due to the relative hardness of the granitic intrusions as compared to the metamorphosed sediments. Hence, by the Eocene Epoch, the paleotopography became highly irregular and the influx of water created a large inland sea stretching from the international boarder directly north to Kamloops and 30 kilometres beyond. An irregular coastline reflected the irregular topography and with slight changes in sea level, fresh lakes could become lagoons and bays could become basins and vice-versa. Therefore, any period of coal accumulation would be marked by a series of small isolated basins and their related tributaries.

This is the basic model used to explain Eocene deposition for Phase I, with the exception of Hat Creek. It is also assumed to be the initial stage necessary for the development of the following depositional models:

B - Penecontemporaneous Sedimentation and Volcanism

The Tulameen, Princeton, Kamloops Tranquille Beds and Chu Chua occurrences either overlay or are overlain by Eocene volcanics and can be simply represented by three models:

- Model 1 predepositional volcanism
- Model 2 post-depositional volcanism
- Model 3 a combination of the two former models with resulting sediments sandwiched between two stages of volcanism (Figure 4).

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PHASE I - BASINAL DEVELOPMENT MODELS

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# A - EOCENE SEDIMENT INFLUX INTO TOPOGRAPHIC LOWS

(1) COAL SWAMP DEVELOPMENT







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B - PENECONTEMPORANEOUS SEDIMENTATION AND VOLCANISM

(1) UNDERLYING EOCENE VOLCANICS



(2) OVERLYING EOCENE VOLCANICS



(3) ALTERNATING PHASES OF VOLCANISM & SEDIMENTATION



C - Post Eocene Volcanism

Both Tulameen and the Princeton coal beds are overlain by Miocene midrange volcanics. This suggests that other Eocene sedimentary sequences could be capped by younger Miocene volcanics (Figure 5).

#### RECONNAISSANCE APPROACH

The basic objectives of Phase I were two-fold. The program was designed to first define Eocene sedimentary sequences and then to concentrate on finding coal in those sequences. A number of different target types were required to cover all possible aspects of the numerous sedimentary models.

First priority targets included all G.S.C. map units which contained any proportion of Eocene sedimentary rock such as the Princeton Group sediments or Coldwater Beds which rest on basement rock (Figure 3). Interbedded volcanics and sediments of the Princeton and Kamloops Groups were also regarded as top priority and investigated (Figure 4 (3)).

Areas mapped as Eocene volcanics of the Kamloops and Princeton Groups were classified as second priority targets. These areas were investigated in the event that possible inliers of unmapped sediment existed under Eocene cap rock (Figure 4 (2)) with stream cuts being the primary area of traverse concentration. Misidentification of sediments and volcanics by the G.S.C. was also considered possible because a major portion of the Hat Creek Deposit was initially mapped as Eocene volcanics.

Mapped areas of Miocene volcanics were classified as third priority targets as this type of occurrence recognized the possibility of discovering unmapped Eocene sediments as inliars under younger cap rock (Figure 5).

The lowest priority targets in Phase I were topographic lows in rocks presently considered basement rock. These were highly speculative in nature, being chosen wholely on elevations corresponding to previously known coal occurrences. C - POST-EOCENE CAPPING

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MIOCENE VOLCANICS OVERLYING EOCENE COAL MEASURES

× x x × x × × x

PRE-EOCENE BASEMENT

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The target areas in Phase I were relatively small and well distributed over approximately 23,400  $\mathrm{km}^2$ . This fact, coupled with the lack of close proximity to bases, made helicopter coverage both impractical and cost prohibitive. The excellent road access, however, enabled us to double our prefield estimated coverage of the area. Initially, road mapping yielded substantial outcrop, after which stream and cliff traverses completed target coverage.

Palyonology samples were collected whenever Cenozoic sedimentary rock was encountered in the field. Also, photographs of appropriate outcrops were taken whenever possible.

No difficulties were encountered while investigating targets around Princeton or Kamloops and all target assessments were well corroborated by sufficient data. Lack of surface outcrop around Merritt made it impossible to assess some target areas in this vicinity to the same confidence level as the other two localities.

### RESULTS

The area around Princeton is dominated by mountainous topography with little or no Pleistocene cover. Road and stream cuts, on the whole, exposed numerous outcrops. Geography of the Merritt area consists of low rolling hills covered with a thick veneer of glacial material, and as a result, outcrop was scarce. The Kamloops area, though dominated by rolling hills like Merritt, did yield moderate to good outcrop exposure.

Table II shows the target areas which yielded sedimentary outcrop, along with the target type which prompted investigation. The only target group in which undiscovered sedimentary rock was exposed, were the Eocene volcanics on basement rock. These sedimentary sequences appeared as inliers sandwiched between volcanic stages. These findings heavily support the validity of penecontemporaneous volcanism and sedimentation mentioned earlier (Figure 4). Since the purpose of Phase I was to locate undiscovered coal, it was thought by concentrating on previously unmapped sedimentary sequences, the odds of achieving success would be at an

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optimum. It was for this reason that all areas mapped by the G.S.C. as Eocene volcanics within the Phase I boundary, were investigated. At the end of Phase I, when time permitted, the search area was expanded to cover the east half of NTS map 82L and the south half of 92P.

Priority	Model	Targets Yielding Sedimentary Rock
1	1) Eocene sediments on basement rock	50, Chu Chua, 53
1	2) Eocene volcanics and sediments interbedded on basement rock	1, 2, 27, 21
1	<ol> <li>Eocene sediments under Eocene or younger volcanic (cap) rock</li> </ol>	6, 30
2	<ul> <li>4) Eocene volcanics on basement rock (possible misidentification or inliers of sediment)</li> </ul>	10, 42, 11, Monte Ck., Spence's Bridge
3	5) Miocene volcanics on basement	None
4	<li>6) Topographic lows in rocks presently considered basement rock</li>	None

TABLE II SEDIMENTARY OCCURRENCES BASED ON MODEL TYPE

Of the Eocene sedimentary sequences investigated, approximately 80% were conglomerate, 15% medium grained sandstone and 5% siltstone. No mudstone or shale was discovered. The conglomerate was poorly to moderately consolidated and consisted of an immature coarse grained matrix with well rounded cobble sized clasts. Three of these conglomerate outcrops (Appendix I, Target 1; O/C RO001; Target 11; O/C R0025; Target 30; O/C R0048) contained carbonaceous logs six inches to one foot in diameter and one to three feet in length. Palynology results (S.J. Pocock, Appendix II) reveal that this organic material, best described as Eocene flora, was deposited as organic debris buried in a high energy stream environment. Often found associated with the conglomerate, was a medium grained lithic sandstone which was poorly sorted and sub-angular in nature.

The upper contacts of the sedimentary sequences were found in Targets 11 and 42. In both cases the sequences were capped by andesitic volcanics.

In Target 11 (Appendix I; O/C HOO11), the sedimentary sequence was composed of interbedded siltstone and sandstone, while in Target 42 (Appendix I; O/C ROO40), the upper contact sequence was massive conglomerate with a few sandstone interbeds. This would indicate variable basin maturity at the time of the second pulse of volcanism, or minor differences in the ages of the capping pulse of volcanism.

Radiometric dating places all the samples which can be dated, within an age between the lower part of Middle Eocene (46.8 my) and the upper range of Lower Eocene (50 my). S.J. Pocock (1982) best summarized the palynological results:

> Environmentally, the sequence is of terrestrial to fresh-water origin, including fresh water stream and swamp deposits and, possibly, soil horizons. It appears possible that, in the area in Tertiary time, there was significant topography and that delta systems drained relatively small cachement areas into lakes and swamps, in much the same manner that we observe at the present. The floras indicate that the climate may have been a little warmer than at present, but that is was no warmer than temperate. A suggested tentative correlation chart is attached...(Table III).

### CONCLUSIONS AND RECOMMENDATIONS

The lithologies encountered in Phase I, considering the high percentage of conglomerate, indicate a high energy environment of deposition which would be less than ideal for coal-swamp development. This prognosis was supported by the palynological studies conducted by S.J. Pocock (1982).

Since the completion of the field portion of the program, a study of selected water hole logs covering the area was undertaken. This study neither revealed any new sedimentary sequences or confirmed the presence of new sequences found during the field season. The application of water well logs is, unfortunately, restricted to overburden information and is not recommended for future studies of this nature.

# Zonation of the Eocene Sediments of the Princeton Group and

Radiometric age determinations

Palynological Zones	Preparations in Authors Co	llection
	Bromley #1	R0025A
	Parr Railroad Locality	R00258 R0025C
		?R0024
		ноо116
	Lamont Creek Coal	H0013 H0014
PRINCETON BLACK COAL	Princeton Coal	
Collins Gulch Bentonite 46.8	my.	
	Vermilion Bluffs	H0004
Princeton Ash 48 - 50 my.		н0006 н0007
Tranquille dolerite 49 + 2 my	7.	
	Asp Creek	?R0039P
		?R0040P
Tranquille Ash 48 - 50 my.	Tranquille locality	
		R0004B
Princeton Biotite Rhyolite 50	) ту.	

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## TABLE III

(From: S.J. Pocock, 1982)

The coal potential of the Phase I area is poor to non-existent and through the indepth nature of the Phase I program, this area can be eliminated as having any future coal development potential, allowing field efforts to be concentrated in other areas of the province.

A final recommendation would include airphoto and landsat studies of the area along trend and north of Hat Creek on the premise of finding a "fault induced low" target type.

### PHASE II

### LOCATION

The area under investigation during Phase II is covered by N.T.S. map sheets 93B and 93G. The specific area of interest encompassed the Fraser River Valley and its tributaries from 60 kilometres south of Quesnel, north to Prince George. Vehicle access included Highway 2 and numerous gravel roads which connect the local, rural communities.

### REGIONAL GEOLOGY

The rock units which underlie the Phase II area are a complex of metasedimentary, igneous including extrusive and intrusive, and sedimentary The metasedimentary units include the Cambrian Cariboo Group, the rocks. The intrusive units Permian Cache Creek Group and a Jurassic argillite. include a Triassic peridotite and the Jurassic Topley Intrusions. The extrusive rock units include the Jurassic Hazelton Group, Paleocene basic volcanics, Eocene acidic volcanics, Oligocene midrange volcanics and Miocene basic volcanics. Some of the above Tertiary volcanics appear to be subaerially extruded, while others displayed subaqueous pillows. The sedimentary units found within the area form part of the Fraser River Formation consisting of conglomerate, sandstone, shale, claystone and The Table of Formations for the area north of Quesnel (Table 4) coal. dates the coal-bearing unit as Miocene (Tipper, 1960) while the Table of Formations south of Quesnel (Table 5) dates the same formation as Eocene and/or Oligocene (Tipper, 1959).

Structural geology includes at least two stages of normal faulting, one set trending north-northeast and one set trending east-northeast. These two fault sets are concentrated and often intersect along the Fraser River Valley. The coal-bearing unit also appears to be concentrated along the Fraser River and its tributaries and may be related to the faulting features. - 18 -

ERA	PERIOD OR EPOCH		GROUP OR FORMATION	LITHOLOGY
	QUARTER NARY	PLEISTOCENE AND RECENT		Till, gravel, sand, clay, silt
CENOZOIC	IARY	MIOCENE AND/OR LATER	Endako Group	Basalt, andesite, related tuff and breccia
		MIOCENE(?)		Conglomerate, sandstone, mudstone, lignite and diatomite
	TERT	PALEOCENE (2)		Andesite, basalt, breccia, tuff with minor sediments
		TO OLIGOCENE		Rhyolite, dacite, trachyte, tuff and breccia with minor sediments
MIDD JURA		LE SSIC	Hazelton Group	Andesite, basalt, related pyroclastics, chert pebble conglomerate, argillite, greywacke
MESOZOIC	LOWER JURASSIC AND (?) LATER		Topley Intrusives	Grandiorite, diorite, biotite granite, monzonite, gabbro
	UPPER TRIASSIC (?) AND LOWER JURASSIC (?)			Argillite, greywacke, andesite, basalt with related tuffs and breccias, conglomerate, shale, limestone
	TRIASSIC			Serpentinized peridotite, serpentinite
	PERMIAN AND EARLIER (?)		Cache Creek Group	Ribbon chert, argillite, volcanics, limestone
PALE0Z0IC	MISSISSIPPIAN (?)		Slide Mountain Group	Chert, argillite, basalt, pyroclastic diabase
	CAMBRIAN		Cariboo Group	Micaceous quartzite, phyllite, argillite, with minor limestone

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ERA	PERIOD OR EPOCH		GROUP OR FORMATION	LITHOLOGY
CEN0Z0IC	QUATERNARY	RECENT		Basalt, basalt breccia, volcanic ash
		PLEISTOCENE AND RECENT		Till, gravel, sand, clay and silt
	TERTIARY	MIOCENE AND (?) PLIOCENE		Basalt, andesite, related tuff and breccia, minor conglomerate, greywacke, shale, diatomite
		EOCENE AND/OR OLIGOCENE		Basalt, andesite, related tuff and breccia, minor conglomerate, sandstone, shale
			Fraser River Formation (?)	Conglomerate, sandstone, greywacke, shale, lignite, minor breccia, tuff and basalt
		PALEOCENE AND/OR EOCENE		Rhyolite, dacite, trachyte, related tuff and breccia, andesite, basalt, minor sediments
	JURASSIC OR CRETACEOUS			Conglomerate, greywacke, argillite
MESOZOIC	MIDDLE JURASSIC		Hazelton Group (In Part)	Andesite, basalt, related tuff and breccia, conglomerate, greywacke, shale
		Not kn	own to be in contact	
PALE0Z0IC	PERMIAN AND (?) EARLIER		Cache Creek Group	Chert, argillite, limestone, greenstone, minor greywacke and conglomerate

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# PHASE II - REGIONAL GEOLOGY SOUTH OF QUESNEL, B.C.

### DEPOSITIONAL MODEL

The majority of the scattered occurrences of coal-bearing sediments previously mapped along the Fraser River are covered in part by Quaternary sediments. The presence of coal measures coupled with the concentration of faults, indicated a fault controlled, basinal development model (Figure 6). This theory suggests that graben type structures in the basement rock formed low relief areas in which sediments accumulated. It is also possible that faulting occurred in these lows during and/or after deposition, thus allowing additional sediment accumulation and preservation of the formation.

The sedimentary coal-bearing units north and south of Quesnel are concluded to be the same unit and appear continuous from the Cottonwood River to Alexandria. This unit appears to represent the Miocene/Eocene drainage system of an ancestral Fraser River (Tipper, 1960).

### RECONNAISSANCE APPROACH

The first priority of this portion of the program was to investigate areas underlain by coal measures previously mapped by the G.S.C. An area immediately east of Quesnel has remained unmapped by the G.S.C. but because of its proximity to a known coal-bearing sedimentary unit, this area became an important target. Other target areas became apparent through detailed aerial reconnaissance for the location of sedimentary outcrop not previously reported.

In the initial stages of the program in the Phase II area a helicopter was used to determine access, gauge outcrop possibilities and to spot previously unmapped outcrop. Highway, all-weather roads and dirt roads were then used to gain access to the target areas. These areas were then investigated on foot. An effort was also made to contact the inhabitants of the area regarding coal outcrop locations.

Near the end of Phase II a brief investigation was made on the coal potential of the volcanic/sedimentary unit stratigraphically overlying the coal measures.

PHASE II - FAULT INDUCED BASIN: GRABEN TYPE





FIGURE 6

Due to the fact that all the rock in the Fraser River Formation is very poorly consolidated, it is often indistinguishable from Pleistocene or Recent river gravels. The clay content of the coal-bearing formation is very high, therefore, these lithologies are very water absorbant.

This high moisture content caused constant active slumping and sliding. This active slumping made river traverses both difficult and dangerous. At the time of exploration, the Fraser River and its tributaries were at flood level. This combination of active slumping and high water covered or obscured many known outcrops.

### RESULTS

The geography of the area is dominated by gently rolling hills underlain by a thick veneer of glacial material. Bedrock is poorly exposed in the areas mapped by the G.S.C. as the Fraser River Formation. Outcrop is only exposed along the Fraser River and a few of its tributaries.

The sandstone is fine to medium grained and poorly sorted. The clasts of the conglomerate are pebble sized, well rounded and composed of quartz, metamorphic and volcanic material. The claystone is light brown or greyish to white and very water absorbant. The Fraser Valley also exposed outcrops of diatomaceous earth. All of the above lithologies are very poorly consolidated and exhibit very few bedding planes.

Coal outcrop was spotted in Target 59, on the east bank of the Fraser River, near the old Alexandria Ferry crossing and on Australian Creek. These outcrops are noted in the 1972 open file report by Master Explorations (T.N. Yoon). Coal float was also located in Target 75a around Moose Heights, north of Quesnel. Both of these occurrences have been known for some time and the one at Moose Heights was mined by local inhabitants in the early 1920's for household heating fuel (personal communication from local inhabitants).

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### CONCLUSIONS AND RECOMMENDATIONS

The Phase II area should not be dismissed as a potential coal area because the presence of known coal outcrops shows there could be undiscovered coal resources in the area. The task of finding and delineating any coal in the area is complicated by the scarcity of surface evidence, lack of apparent bedding planes and very limited knowledge of the structure and stratigraphy of the coal measures. The unconsolidated nature of the Tertiary sediments implies a low grade of coal quality and this is supported by core analysis done by Master Explorations Ltd. (T.N. Yoon, 1972) which ranks it as lignite/subbituminous "C".

The volcanic unit with associated sediments stratigraphically above the coal measures was thought to have moderate coal potential. Upon investigation it was found that the sediments in this unit made up approximately 2% to 5% of the total unit. The sediments were very immature, discontinuous clastic pods and had been baked by the dominating volcanics. The coal potential of this unit is essentially nil.

Coal potential in the Fraser River Formation is moderate to good, but due to the lack of surface evidence and lack of G.S.C. interest in the area, a drill program would be the only feasible approach to assessing this potential. Recommended work to plan such a program would include mapping the Fraser River by river boat when the Fraser is at low water, a search of the B.C. Archives to locate old coal adits in the area and investigation of B.C. government gravity surveys to try and pinpoint the area underlain by coal. Water well logs of the area have already been obtained and are essentially useless.

### PHASE III

### LOCATION

Phase III coverage was concentrated along the Bowron River Coalfield trend, the Willow River and structural trends along the Fraser River (Rocky Mountain Trench). The area was covered by N.T.S. map sheets 93G-E 1/2, 93H-W 1/2 and 93I.

### REGIONAL GEOLOGY

On a regional scale, the search area is bounded to the south by the Purcell Arc, to the west by the Rocky Mountains and to the east by the Phase II reconnaissance area. Table 6 shows the geological formations of the area with the upper Cretaceous/Paleocene Bowron River sediments being the coal-bearing unit.

### SEDIMENTARY MODELS

Three models exist as an explanation of the coal occurrence at Bowron River:

Model A - Faulting and Subsequent Deposition

A° graben formed between Mississippian and Paleocene time creating a regional low and allowing a depositional basin for coal to form (Figure 7). This is the presently accepted model held by various authors. The following two equally valid theories were proposed for reconnaissance this summer.

Model B - Penecontemporaneous Faulting and Deposition

A graben type fault forming a basin could have occurred contemporaneously to Tertiary sediment accumulation and subsidence. With the proper genetic conditions and subsidence accumulation ratios, areas of coal swamp build-up could have occurred (Figure 8). - 49 -

PHASE III - REGIONAL GEOLOGY OF THE BOWRON RIVER AREA

ERA	PERIOD OR EPOCH		OR GROUP OR FORMATION		LITHOLOGY
ZOIC	QUART- ERNARY	PLEISTOCENE AND RECENT			Alluvium and glacial deposits; gravel, sand, silt, till
DIC CENO	TERT- IARY CRETA- CEOUS	PALEOCENE OR UPPER CRETACEOUS			Bowron River coal beds: conglomerate, breccia, sandstone, shale, coal
MESOZ	TRIASSIC? (UPPER TRIASSIC?)				Phyllite, argillite, minor limestone and quartzite
	MISSISSIPPIAN(?) OR YOUNGER				Serpentinite
	MISSISSIPPIAN		. GP.	Antler Formation	Pillow basalt, breccia, tuff, minor diorite and gabbro; chert, argillite, lithic sandstone
PALE0Z0IC			SLIDE MTN	Guyet Formation	Conglomerate, argillite, lithic sandstone minor basalt; includes Greenberry lime- stone, member of crinoidal limestone at or near top of formation
	DEVONIAN			Black Stuart Formation	Basalt, chert, chert breccia and dolomite breccia, upper unit siliceous or cherty argillite and phyllite, chert, sandy limestone, sandstone
	LOWER AND UPPER CAMBRIAN			Dome Creek Formation	Shale, siltstone, limestone, argillite, phyllite
	LOWER CAMBRIAN			Mural Formation	Limestone, shale, phyllite, minor silt- stone and sandstone
	LOWER CAMBRIAN AND/OR HADRYNIAN		CARIBOU GP.	Midas Formation	Shale, siltstone, phyllite, minor sandstone
				Yanks Peak Formation	Quartzite, siltstone, granule and pebble conglomerate
				Yankee Bell Formation	Shale, siltstone, limestone, sandstone, phyllite
PROTEROZOIC				Cunningham Formation	Limestone, dolostone, shale, phyllite
	HADRYNIAN		Issac Formation	Phyllite, argillite, schist and shale, minor siltstone, feldspathic sandstone and conglomerate, limestone	
			K (incl	aza Group udes Snowshoe) Formation)	Feldspathic sandstone and granule conglomerate, locally schistose and micaceous, argillite, phyllite, schist, minor conglomerate, limestone and marble

PHASE III - BOWRON RIVER COAL FIELD MODELS

# A - FAULTING & SUBSEQUENT DEPOSITION

(1) PREDEPOSITIONAL PHASE

s,





FIGURE 7

- 20 --



FIGURE 8

Model C - Widespread Deposition and Post-Depositional Downfaulting

It is also possible that a Tertiary sedimentary basin occurred through the central B.C. region with coal deposition occurring in a widespread fashion where proper physiological and depositional conditions were found. Local areas of post-depositional downfaulting related to post-Eocene tectonic activity have preserved isolated remnant basins from erosion (Figure 9).

### RECONNAISSANCE APPROACH

During the initial stage of Phase III, considerable time was spent flying the Bowron River and Willow River trends. This helicopter coverage provided outcrop locations which were later investigated by foot traverse. A large percentage of time was spent investigating the Bowron River and its tributaries.

#### RESULTS

In the area north of Bowron River Coalfield, the topography is extremely flat and is covered with a thick veneer of glacial and alluvial material. The area directly south of the coalfield is more rugged with numerous outcrops exposed along the river and especially along the logging road which runs parallel to the Bowron. All outcrop south of the coalfield, upon investigation, turned out to be the metasedimentary unit of the sedimentary-volcanic Slide Mountain Group, Antler Formation.

A study of the coal unit revealed that all three models could be considered valid in light of the existing geological configuration. Because of the apparent faulting and rather steep bedding orientation, it is likely that a post-depositional structural event occurred to help support Model C. On the other hand, the highly variable stratigraphic section observed could indicate a highly fluctuating environment due either to pulses of subsidence and sedimentation or a rapidly changing depositional environment possibly typical of an unstable sedimentary basin. This would concur with Model B. A combination of the two is apt to be more likely though, with Model B occurring in a small degree as a part of a widespread depositional basin, followed by the preservation features of Model C.

- 28 -

# C - WIDESPREAD DEPOSITION & POST-DEPOSITIONAL DOWNFAULTING



FIGURE 9

## CONCLUSIONS AND RECOMMENDATIONS

The coal potential of the Phase III area is essentially nil, with the exception of the Bowron River Coalfield. A study of available government gravity surveys and Landsat coverage should be conducted to fully assess the potential north of the Bowron River Coalfield.

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TAREET SUMMARIES - PHASE 1 APPENDIX I a) CRITERIA 6006 THRAET - Edene sedimente on basement rock - Eccane volcances and sediments interbedded 2 on basement rock - Escene sectionents under Escene or yourgen Volcame cap lock. 3 - Ecane volcanics on basement rocke (cossible musiclentfication of inlians of sediment) miscene volcanico on basement (possible 5 windows of sectimente.) - Topographic lows in rocks presently 6 considered basement rocked, is plasse or Triassic volcanics or interestives that may contain isolated basins

TARGET SUMMARIES - PHASE 1 -\* Denotes target not covered JUNE 2 - JUNE 28/82 TARGET TARAET MODEL DESCRIPTION OF GEOLORY MAP (TYPE) The sedments encountered included 1 2 a basal conclamente, containing volcanic clasto, and Carbon accous wood fragments (qz +/<del>)</del>| overlain by condium grained sand-stoner. Flanking volcanics were anducities and basalts ( Fig Hoos 7sandstone of on Sunday Creek, 40008 ty/accous sandstore, moors-is - sandstone outcop on HWAY 3.) angular octoble conglamerate 2 (92H[1) sandwiched by andes the Volcanico with no finer grained sedimento forcal. (UFig Hodiz-conglo-merate on Crater Mountain) 3 Priority 2 - small. Three rock units were mapped З 🗄 (12 H/S) and included the Appen Triassoe Theola Stong containing linustere argillite and volcanico; Escene basaltic volcanico of the Prince ton broup and a very unconsolidated sandstone outerops, possibley Pleistocene. 5\* 3 Provity 4 - Small, not easily accessable. (a2 H/I) Outerap in carea was scarce and (921/2 revealed only resistanta conglomenates containing inthusive ivoleanic clasts. Provity 03 - small 4 924 8)

4.1

DESCRIPTION OF GEOLOGY THEGET THEAST MODEL (TYPE) NUMBER YOLCANICS WITH COMPOSITIONS RANGING 4 10 (92 H/7) FROM BASALT TO DACITE WITH ONLY ONE SEDIMENTARY OUTCROP OF CONSCORTE OCCURRING SPACIALLY ASSOCIATED WITH VOLCANICS & PROBABLY DIS 812 BEINA A DEBRIS FLOW RELATED TO VOLCANISM. Priority 4 - not easily accessable (42 H 114) Priority 4 - no related sediments. 5 (92H/15) micela bioup volcances and sections 4 H°. (924/2) boardcred the target and conto crostly basathe volcanico, Vanous redimentary outergas were located, one being silestone (845° / 24° 5E) capped by ander Kc volcanco; another a sherry ressonside enec including sandstones, chapstone ? seltstoke with some bide contenne Canbonaceous twigs . (PHOTOS HOOII-anders (prulis) overlying sandstones & Siltstones +10012 - sandstone with Elay matrix, HOOI3 - sandstone with clay matrix) Physites, andesites i basatts were the only rock 14, 15, types encountered. 4/10 (924/2-9) 6/7/9,20, (924/2-9) 6/22 # 6 · Diority 4. 787419) 62419) pertax 18,2% intrusives of grante and grandorite composition. Q (92H) (9-16)

DESCRIPTION OF GEOLOGY TARGET MODEL TARGET (TYPE) NUMBER The micola know with Target in 6 24 outerop being basalts. the only (92 ú (16 ) Wority 4 6 25\* 924/16) Nicola Group metasadments and 26 Þ werbunden. (924/10) Small outlin of hoodoo" forming Conglomerate of the Kathloopo 27 2 92I(15) Braup Tranquille Beds. Conglomerate contains anghelan-antorounded volcame pebbles and cobbles. Layered volcanic flows. 28,56 2 (921/H-) U Large outcrop of basalt an hill top. 4 29: (92I/15) Target contained two well consolidated. 30 outcrops of sandstone and limestone (921/15) and an extensive roadside cut of ECCENE Sediments. This outcrop consisted of interbedded conglomerate and Sandstone with arganic horizons ¿ coalified plant fragments (155/15°s EDCENE sediments were located and 31 consisted of conglomenate, sandstone and siltstonen underlying Volcanic (925/10 and 92 I/15) cap; otherwise no new sectimentary locales were observed.

DESCRIPTION OF GEORGEY TARGET MAD CRITERIA andes. he - basaltic volcanics with no 32 4 (921/4) related sedments. Exposure very good and only rocks of the Cache Creek Stroup 6 33 (925/9) were observed. 34 (921/9+0) Tertiary volcanics, flow breccia and conglomerate were located as 2 mapped Triassic basic volcanics and chloritic schots of the chicola lopeoup. 35 6 (925/9-10) area collect by target includes 36 6 units mapped as Cache Creek top 927(8-9) Mcola bo and Coast Untrusions though and outcrop was seen due to extensive overbunder. outcrop seen due to placed No 37 4 (121/9) 4 Rhydetic and basaltic volcance observed. 38. <u>9218-9</u>) ? where is this longet ? 39 40 e ant crop seen was consily Tertiary 2 41 volcanics consisting of basalts, andiester, (92I/8-9 Mystle, flow breaches and debris flows. The enterop of sando tone is camped they a basalt flow sthat baked the redimento to geodes and agates in the outcrop.

DESCRIPTION OF GROKORY TARGET MAP CRITERIA 4 42 Most of the outcrop encountered was volcanic with one large occurance of Condonate which capped met. Savana, It contained very (92I/10) large boulders (2mx/m) of busalt and several inter be the of harizontally bedded sandatele brated asterop of Coldwater Bedog 43 921 7 He Eccene Kamboops Broup which consisted of conclomente with a Sandstone matrix. Servounding. micola Broop Volcanico nere feend. 44. Nicola Aloup Volcanice and 4 (925/7) openburder) 4s <sup>₹</sup>, Priority & 921/7-8) Heavily contered with outerbuilded. 46 ک 92I/3) Brierity 4. چ 72I/1-8 Phiority 4 V 721/1) 49.4 4 Priority 4 (92I))

MAAE TH DESCRIPTION OF GEOLOGY TARGET CRITERIA MAP lavas predominated outcrop 50 . Barache ļ (921/2) with the one occurrance of sediment being congromerate. Only Escene volcanics and Trassic Q **5**1 (92I/s)Aita sedimento encountered. Priority 4 - Very remote 52\* 4 (925/13) no outdop except oxidized glacial 53 (925/13) 54\* Providy + - access difficult. 4 (925/13) 55 \* Phiarity 4 - no access. 4 (925/13) 56. (see# 26) 4 One outcrep abaurred consisted 57 June grained til and a coarse (92I/11) nearby conglonerate // sandstone interbed (0580/20°5e) SPENCES Located one small outcrop of medium BRIDGE grained sandstone containy toal (925/6) plant fragments. CHUA Conglamerate outcroper where seens but access to the Chu Chura coal (92P/8) occurrances was prohibited by He presence of a reservations.

PALYNOLOGY SAMPLE LIST: DA PRIME PHISE

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	,	BC	RECON	J - 21/1	ISE L		_
	SAMPLE #	TARGET#	DATE	ERSTING	NORTHING	SAMPLE DESCRIPTION	SEND
	R0001 a	10	1/6/82	675900	5457700	Volcaniclastic with	t (
	6	10	1/6/82	675900	5457700	woody material	
	RODOZ	10	1/6/82	680500	5480900	Carby stringers in	
						coarse around sand	
						stone.	
	R0014	10	2/6/82	676200	5461900	Conglomerale matrix	
	R0024a	11	3/6/82	682600	5450150	Conglomerate bratrix	
	6	11	3/6/82	682600	5450150	sandstone	4
	R0025 a	11	3/4/82	684800	5449900	sandstone e 1 wood	~
	Ь	11	3/6/82	684800	5449900	sandstone	
	C	11	3/6/82	684800	544 9900	sandstone in wood	
	R0027	11	3/6/82	686500	545095	Conglomerate matrix	
	R0018	11 -	3/6/82	679000	5451200	argillite-NicolaGp.	
	R0031	4	4/6/82	709800	5479100	sand-Pleistocene	
	R00 39	42	11/6/82	653250	5613000	siltstone	
	ROO40	42	11/6/82	653800	5616800	sandstone.	$\checkmark$
	R0043	Bridge	13/6/82	557970	6179500	sandstone.	
	R0044	31	15/6/82	673150	5623500	Sandstone.	$\checkmark$
	R0045	30	16 6 82	652500	5637250	shak - J. or K?	:
	R0046	31	16/6/82	64 8280	5644950	Conglomerate	
			, ,			matrix	
	R0047	30	16/ 6/82	647300	5697600	sandstone	
	R0048	30	16/6/82	6478 50	5643150	sandstone e	
						shale.	:
	10049	30	17/6/82	647500	5643100	sandstone s	
	2		, ,	1 <b></b>		shale - K!	
	ROOSI	27	17/6/82	642450	5640600	conglomerate	:
						matrix	
	R0052	~ 28	17/6/82	67/750	5646300	conglomerate	
`	_					matrix	
•	R0654	57	23/6/82	634900	5620500	tuffaceous	
	•		a lila	·		Sandstone	
,	R0055	57	23/6/82	635300	5620450	sandstone	
	R00569	Monte	24/6/82	301300	5614600	sandstone	
	d	Creek	24/6/82	275700	2601600	sandstone E	
						matrix	
						· · · · · · · · · · · · · · · · · · ·	

TALYNOLOGY SAMPLE LIST: Dunge

	BC	KECO	V Porter	ise I	<u>.</u>	
SAMPLE #	TARGET #	DATE	EASTING	NORTHING	SAMPLE	SEND
÷		2 my			DESCRIPTION	
R0057	42	26/6/82	654300	5519800	Sandstone -	
		,			Nicola Gp7	
ROOSS	Reck	26/6/82	665706	5525700	sandstone é	
	Point	/-/			siltstone	
R06 59	11	26/6/82	665300	5529200	Sandstone 2	
		/ - / • =			Siltstone	
H0004a	1	1/6/82	675900	5457650	Conglomerate matrix	
6	. /	1/6/82	675900	5457650	sandstone	
HOODS	1	2/6/82	677400	5459500	Conglomorate matrix	
H0006	1	2/6/82	677600	5459600	sandstone	
H0007	1	2/6/82	676750	5458950	sandstone	
40008	1	2/6/82	677650	5459550	sandstone	
#0610a	1	2/6/82	679300	5458250	Conglomerate matrix	
<b>b</b>	1.	2/6/82	679300	5458250	diatomaceous clay	
H0011 a		3/6/82	68/500	5448000	sandstone i silt stor	e
5	11	3/6/82	681500	5448006	siltstone	
H0G12	11	3/6/82	681500	544 8000	Sandstone	
40013	11	3/6/82	68/850	544 58 50	Sandstone	
H0014	//	3/6/82	682150	544 54 50	sandstone	
H0015	1	3/6/82	678200	5453250	sandstone	
H0017	2	4/6/82	716600	5453350	Conglomerate	a.
					matrix	а. С
HO0 19		6/6/82	699700	5447600	cong/omerate	
					matrix	
	4.					
		a	i			.e
si e e			:			
					1 · · · · ·	

20025 a	THEGET II PLACER MTN	AGE OF SEDS IN MAPPED VOL, UNIT.	587
	MT SAVONA	SST IN CONGL.	
R0040	TARGET 42	HOGE OF IBS OF	55 F
	PLACERMITN		
R0024b	TARGETI	"	55 -
	PRINCETON	SEDS .	
R000 2	TARAETIO	EXACT AGE OF	55 T
H	LOCATION	PCHSON	ROCK TYP
SAMPLES	FOR PANALYSIS	PHRSEI	

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SAMPL	es for ANALYSIS	PHASE Z	RB
#	LOCATION	REASON	ROCK TYPE
R0048	TAR45T 30	- UNCONSOLIDATED 5	- SST ESHACE
	CRISS CK.	RESEMBLES EOLENE SEDS	
		FOUND IN AREA - MAPPED	
		195 CRETPLEOUS.	
R00 44	TARGET 31	- SOT - PLEIST.	- 55F
R0043	SPENCES	- SED IN VOLC. THRAFT	- <del>5</del> 5 <i>1</i> -
	BRIDHE		
R0056	MONTE CREEK	- SEDS IN VOLC. TARAET	-35É
		MAPPED AS TO INCLUDE	
		SEDS.	
40058	RED POINT	- EXACT AGE OF TEANQUILE	sst-silt nor
		BEDS ON NORTH SHORE OF	
		KAMLOOPS LK.	

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TARGET # /

1 i) Dates Worked -- 2hrs. June 1 (H.H & RB.), JUNE 2 (H.H.), 2hrs June 3 (H.H.) ii) Outcrop #'s -- HODOH - HODOHO, HODIS, HODIG iii) Sediment Sample . #'s -- HODOMA, b, HODOS -HODOS, HODIOA, b, HODIS iv) Map Sheet -- 92H/2, 92H/7 v) Photos

II

# i) Traverse Description:

JUNEI - Hwy 3 South to O.C. # HODDY & RODDI JUNE 2 - 1/2 down Junday Creek from Hwy 3 - road traverse parrallel to sunday Cr. JUNEB - drove morth from tip of Manning Park along HW4 #3.

ii) Rock Types Encountered: Plang Hay 3 the sediment to the north is a coarse matrix rounded cobble conflomerate associated with green andesitic source reck containings and stone with occassional corby wood fragments ranging from 3-40 cm in length. Proceeding south the cobble conflomerate passes into a mature sub rounded to rounded medium grained massive sandstone higher in the section. Bedding reddings are rare due to the massive, recreasive nature of the sectiment. Sunday Creek was dominated by conflomerate and one outcrop of diatomaceous clay over lying the conflomerate and one autors have be of the Creek though was exclusively

iii) Description of Outcrop/Topography:

Outcrop occurs mostly along road cits and along streams where topography is the steepest

# III Target Summary

The sediments fall within The FISC mapped boundaries and perhaps correlate with those jound in area II. Later erosion by the Similkameen has isolated the occurrances.



TARGET # 2

i)	Dates Worked	Zhrs 4/6/82, (H.H.)
ii)	Outcrop #'s	H0017-18
iii)	Sediment Sample #'s	H0017
iv)	Map Sheet	92H/1
v)	Photos	

II

i) Traverse Description: Road traverse up cart trail on the side of Crater Mtn.

ii) Rock Types Encountered: The lower third of the road cut into andesitic volcanics, the middle through an Eocene cobble conglomerate with clasts of 2-20cm in a lithic matrix, and the upper third revealed volcanics

TARGET #





I i)	Dates Worked		I crew day,	4/6/82	(R.B.)
ii)	Outcrop #'s		R0031		
iii)	Sediment Sam #'s	ole 	ROOSI		
iv)	Map Sheet		92 H / 8		
v)	Photos				

II

i) Traverse Description: Road traverse up logging road 3/10 km east of stemwinder Provincial Park, South to McNulty Cr. Stream traverse 1/2mile upstream on small tributary.

ii) Rock Types Encountered: These included volcanics, argillites and Limestones of the Nicola 6p; guartz monzania and granite of the Coast Intrusions, Eocene volcanics and Pleistone sandstone.

iii) Description of Outcrop/Topography: Outcrop was rarely found on road cuts but on hillsides. Topography was very steep but upon reaching the target it bécame gentler. Target Summary area was heavily covered by till and no outcrops of interest were found. Evene sediments mapped by the GSC were not becaked but it is a possibility that the sandstone found is unconsolidated Evene III sediment resulting Plaistocene. Possibility of coal occurring is som.



TARGET # 6

I i) Dates Worked -- 1 crew dag 9/6/82, 2hrs 10/6/82 (RB)ii) Outcrop #'s -- ROO32 - 35iii) Sediment Sample #'s -- NIL iv) Map Sheet -- 92H/15, 92I/2

v) Photos

II i) Traverse Description: Area was easily reached off they 5 south from Merrit. all was covered by road except 2km on foot due to road blockage.

ii) Rock Types Encountered: Included volcanics, volcaniclastics, prod Very coarse conglomenate of socene age. Drift was very thick,







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92H15





I i) Dates Worked -- / crew day, 2/6/82 (R.B.) ii) Outcrop #'s -- ROOOI, ROOO3-15, HODOI-3 iii) Sediment Sample #'s -- ROOIS iv) Map Sheet -- 92 H/7 v) Photos --

II

i) Traverse Description: Stream Graverse of Friday and Saturday Creeks with some x-country hiking.

ii) Rock Types Encountered: Most outerop encountered was volcanic ranging from basalt to dacite usually porphoritic. The one sediment showing was sandwiched between volcanics. Granites and granodiorites of the Copper Credite Intension whe close seen.



(For traverse location see mylar with Target # 1)

TARGET # //

I i) Dates Worked -- / crew day, 3/6/82 (RB.) ii) Outcrop #'s -- Roo16 = 30 iii) Sediment Sample Roo14, Roo24a; 6, Roo25a, b; c, Roo27, Roo18. #'s -iv) Map Sheet -- 92H/7 v) Photos -- NIL

i) Traverse Description: Road traverse up Placer Cr. Logging road access from Huy 3 south of Princeton.

ii) Rock Types Encountered: Nicola Gp. volcanics and argillites outside the target and Ecane Volcanics and sediments in target boundaries. iii) Description of Outcrop/Topography: all outcrop consisted of

Topography was componitation but not steep. Jome overbunden but was not excessive.

III Target Summary Eccene rediment outcrops included conglomerates (very badly weathered and gosseny) along with very ressessive sandstones and sitestones such as at Roozs. Due to The ressessive nature of these sediments chew outcrops probably could only be located if new roads were ect.

TARGET # //

i) Dates Worked -- 2 crew days; 3/6/82, 6/6/82, (H.H.) ii) Outcrop #'s -- HOO11-14, HOO19. iii) Sediment Sample Hoomash, Hoomz, Hooms, Hoom, Hoom, iv) Map Sheet -- 92 H/1, 92 H/2

v) Photos -- NIL

II i) Traverse Description: Logging roads on west side of target. good but poor on east side.

ii) Rock Types Encountered: On the West Aide Escane valcanics and the upper contact of a sedimentary unit & volcanic cap were encountered. This consisted of sandstone and sittstone topped by a rhystitic volcanic flow.

iii) Description of Outcrop/Topography:

Target Summary The sedements found in target I and this target imay have once there one continuous unit sandwiched by the volcanics of 10 and 11. Present exposures are a result of glaciation and cosion. III





TARGET # 14, 15, 24

i) Dates Worked -- 1 crew day, 9/6/82; (H.H.) ii) Outcrop #'s -- NIL iii) Sediment Sample #'s -- NIL iv) Map Sheet -- 14 : 15 - 92 H/15; 24 - 92 H/16

v) Photos -- NIL

II

i) Traverse Description: Road traverses wirl done on loose surface dry whether roads through all three targets. Access was excellent on target 24 with numerous logging roads tranching off the main gravel road. Road coverage of target is was adequate but that of 14 poor. Target 25 Wist of 14 was inaccessable by road due to overgrowth.

ii) Rock Types Encountered: R: Nicola Gp : Basalts Fe: Coast Intrusions: diorite IK: Ringsvale Sp: Volcanic braccia Mioane: Princeton Gp: andesite, basalt.
iii) Description of Outcrop/Topography: Outcrop consisted mostly

of roadcuts, but also accorred along pillsides. Tranches dug on target 24 supposed basic Volcanic rocks. Exposure on all targets was poor due to a heavy cover of drift. Topo was hilly.

III Target Summary Since ino Eccene sediments were found in this area, prospect for coal are poor



92 H/16



I i) Dates Worked --  $\frac{1}{2}$  crawday  $\frac{4}{6} \frac{82}{82} \frac{4.4.5}{4.4.5}$ ii) Outcrop #'s -- NIL iii) Sediment Sample #'s -- NIL iv) Map Sheet --  $92H \frac{7}{7}$ v) Photos -- NIL

II

i) Traverse Description: Road traderses along various roads in the area.

ii) Rock Types Encountered: ALL rock types seen where volcanics including rhyolite, andesite and tasalt. Overburden was very thick on the upper roads

iii) Description of Outcrop/Topography:

III Target Summary No for ther work needled as no sectiments where located.



## TARGET # 18,21,23

I i) Dates Worked -- 1 crew day, 5/6/s2, (R.B) ii) Outcrop #'s -- NIL iii) Sediment Sample #'s -- NIL iv) Map Sheet -- 92H/9, 92H/16v) Photos -- NIL

II i) Traverse Description: Read Gaverse with access from Princeton on Hasys to the Teeper Lakes cornor (secondary road to Summerland) From this road logging trails and cart tracks wire taken.

ii) Rock Types Encountered: Only granity some quite spectaculor Containing lorge phenocrysts of Espar.

TARGET # 18, 21,23

iii) Description of Outcrop/Topography: Exposure was very good along the road cuts. The topography was very hilly & guite steep in places. Target Summary Mapped by the 650 as intrusive this was what was purch. No sediments import Pleistocene difft while found. III



92 4/16

4 N







I i)	Dates Worked		1 crew day, 5/6/82	(H.H.)
ii)	Outcrop #'s		NIL	
iii)	Sediment Sam #'s	ole 	NIL	
iv)	Map Sheet		924/10	
v)	Photos		NIL	

111

i) Traverse Description: Addess by rough logging roads.

ii) Rock Types Encountered: ALL Triassic Metasediments Coleved by a great deal of overburden.

TARGET # 26

iii) Description of Outcrop/Topography:

III Target Summary No for ther work needed as no addiments of interest were located.





Ι i) Dates Worked -- 2hrs 16/6/82 (R.B.) ii) Outcrop #'s -- Rooss iii) Sediment Sample #'s -- N/L iv) Map Sheet -- 92 I/15 v) Photos -- NIL

IΙ

i) Traverse Description: Access all by road, through middle of target.

ii) Rock Types Encountered: Large hundes where spotted made

TARGET # 27

iii) Description of Outcrop/Topography: Outcrop of hoodoos occurred in valley of the Deadman River and in small occurrances by the side of the road. Target Summary Exposure was all conglomerate Surrounded by volcanics so limited Possibility of coal. III

.

I i) Dates Worked --  $2 \text{ Ars } \frac{16}{6} \frac{82}{82} (R \cdot B)$ ii) Outcrop #'s --  $N \cdot L$ iii) Sediment Sample #'s --  $N \cdot L$ iv) Map Sheet --  $92 \cdot I \frac{15}{5}$ v) Photos --  $N \cdot L$ 

i) Traverse Description: Access by read.

ii) Rock Types Encountered: All rocks while Eocenic basache Volcanics.



I i)	Dates Worked		1 crew day 16/6/82, 1/2 crew day 17/6/82 (R.B.)
ii)	Outcrop #'s		ROD45, ROOH 7-49
iii)	Sediment Samp #'s	le 	ROOHS, ROOH7 -49
iv)	Map Sheet		92 I/15
v)	Photos		

i) Traverse Description: All target access by road.

ii) Rock Types Encountered: All sediments though some and of guestion able Cretaceous age.

iii) Description of Outcrop/Topography: Exposure ranges from good to poor and is all found on road cits. The topography is mountainous with deep, steep sided Valleys. III Target Summary Criss Creek could be traversed but it is doubtful if any other seds would be located. any other interesting outcrops thought to be Evane in age such as ROCH7 \$48 would probably the topographically high.



i	) Dates Worked	1 ones day 15/6/82, 1 crew day 18/6/82 (R.B.)
ii	) Outcrop #'s	ROU44, ROU46
iii	) Sediment Sample #'s	RODHG
iv	) Map Sheet	921/10,921/15
v	) Photos	NIL

II i) Traverse Description: Road access on the Trangville Creek Noad and its related roads very good. access for the Watching Creek streams traverse through the Bathelor Hills Rd.

ii) Rock Types Encountered: Volcanias were the dominant lithology with only two outcreps of related sedimentary rocks located.

111

TARGET # 3/ iii) Description of Outcrop/Topography: The topography ranges from steep to flat and outcrop exposure from good to poer respectively. Target Summary area is accertained of being volcanic III with most of the subcrep Seen in The stream Valleys. Some work could be done towards The north on the ajoining comap sheet. See map with target 30 for traverse Socations.



## TARGET # 32 = 33

I i) Dates Worked -- 1 ones day 19/6/82 (R.B.) ii) Outcrop #'s -- NIL iii) Sediment Sample #'s -- NIL iv) Map Sheet -- 92 I/16 - 32 ; 92 I/9 - 33. v) Photos

- NIL

II

i) Traverse Description: Access by road covered most of 32 but parts of target 33 were in accessable due to Jan. Indian reservation.

ii) Rock Types Encountered: Rock autorop consisted of Cache Oreck Ap. argillites, volcanico and limestones, Scattered out dops of Eccare Volcanics whe seen an farget 32.

TARGET # iii) Description of Outcrop/Topography: Tepography of the land is gentle hilly land with good exposure on hillsided. Target Summary No sediments of Eacene age were found related to volcances in target 32, nor in the topographicly low target III 33 .





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TARGET # 34 2 35

I i) Dates Worked -- '/2 crew day (L.G.) ii) Outcrop #'s -- NIL iii) Sediment Sample #'s -- NIL iv) Map Sheet -- 92I/9,92I/10

v) Photos -- NIL

II i) Traverse Description: Access was hampled by "cono authorized personnel" roads surrounding The mine. Qway from The mine, access was very gold in the hiway and on secondary gravel roads.

ii) Rock Types Encountered: Target 34 - Tentiory volcanics, flow breacia i conglomenate. Eacene sediments were not 'seen as access was blocked by The mine and city development. Target 35 - Triassic basic volcanics and chloritic schist in float.





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I i) Dates Worked -- 1 crew day 11/6/82 ii) Outcrop #'s -- NIL iii) Sediment Sample #'s -- NIL iv) Map Sheet -- 92 I/8 v) Photos

-- NIL

i) Traverse Description: Access good to targets by range roads II

ii) Rock Types Encountered: Overbunder only

III) Descrit	otion of Outcrop	p/Topography:	Gentle	hilly sage	e bread	
III Targe	t Summary 90	o outerop	30 LNO	charce	g = 21/20	Steret
III Targe	t Summary Ma Y Secto	o outcroj- mento :	50 CRO	chance	g expo	Sec.e.C.
III Targe	t Summary Ma J Sector	s outcrop mento :	30 LAVO	chance	g- 21/20	Stert
III Targe	t Summary Ma of Secto	o outcrop mento :	30 CNO	charce	og expo	Secre
III Targe	t Summary Ma Y Secto	o ovicnoj: mento :	50 CNO	Aare	g expo	Sec.e
III Targe	t Summary Ma Y Secto	o outcrop mento :	50 CRO	chare	g . 57/20	Steerst
III Targe	t Summary Ma J Sector	o outcrop mento :	300 LANO	Aare	g- 2170	Stert
III Targe	t Summary Ma g secu	o octorop mento :	: 30 LNO	celarce	g 5470	Steret
III Targe	t Summary Ma Y Sect	o outcrop mento :	. 30 <i>L</i> NO	clarce	g 54,00	Secre
III Targe	t Summary Ma Y Sect	o outcrop mento :	. 30 <i>LN</i> 0	clarce	g 57,00	Secure





**TARGET # 38** 

I i) Dates Worked -- 1/2 crew day 10/6/82 (H.H) ii) Outcrop #'s -- NIL iii) Sediment Sample #'s -- NIL iv) Map Sheet -- 92 I/8

v) Photos -- NIL

i) Traverse Description: Access gite good using range roads

ii) Rock Types Encountered: Volcanico - Eacene basalts and andesites found an perphery cathing up section through volcanics.
TARGET # 38 iii) Description of Outcrop/Topography: Flat, plateau top revealing no entrop. Target Summary 40 chance for exposure of polestial Escare sediments. III H.V.



TARGET # 40, 41 and Monte Hills

) I	) Dates Worked	(monte Hills) 1 craw day 24/6/82 (R.B), 1 crewday 25/6/82 (R.B)
ii	) Outcrop #'s	ROOSG arb (Target 41)
ii	i) Sediment Sample #'s	ROOS6 as b
iv	) Map Sheet	92 I/8, 92 I/9,82 L/NW, 82 L/SW
v	) Photos	

II i) Traverse Description: Only the south half of target 40 and the west of target 41 were accessable. Access through the Mente Hills region was good using various lossing roads i right g ways.

ii) Rock Types Encountered: Racko seen were mostly Terthory Volcanics consisting of basald, andesite, ihyolite, flow bleccia and debris flow with a biotite sich granite seen as Maste Hill. The two sedimentary enteress consisted of conglemente and sandstore.

iii) Description of Outcrop/Topography: The topography was very hilly with outcrop being seed in road with and hills des with amount of exposure varying from area to area. Target Summary Tertiony sediments were very local in extent. Their deposition was likely related to encuby volcame activity, rather than to any clastic sedimentary environment eg being the typaceous sandletone below a volcanic cap at actorop Roose b. Because of this, any significant coal theckness would be unlikely. III





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## TARGET # 4/2 2 43

- I i) Dates Worked -- / crew day 12/6/82 (H.H.); 2 crew days 11-12/6/82 (RB); ii) Outcrop #'s -- R0038-42
  iii) Sediment Sample #'s -- R0039, R0040
  iv) Map Sheet -- 921/10
  - v) Photos

II

i) Traverse Description: Access from Memitt to Logan lake and frem there and gravel roads. Target 43 center not be completed adequately because of private property but Luy cuts exposed volcanics of the Accola kps. Foot traverse was also done down Mt Savona an 26/6/82.

ii) Rock Types Encountered: Target 43 was mapped as Ancola Broup with one small area of Eccene coldwater sediments. This was found to be a conformerate and is outcrop Rooss. Target 42 mapped as Escene volcanics though imit savana was found to be capped by a conformerate with sandstone interbeds.

TARGET #

iii) Description of Outcrop/Topography: The topography was generally gentle, flat country & outclop was rather scarce, at ligher elevations (eq. unt. Savara) Itroigh anterop was revealed in roud cuts and give abundant Target Summary Title else can be done and the target III cas it is so flat - interesting apaint is the conglomentate land medium grained sandstores found at the top of mit Savona - the highest point in the Surget. Perhaps this sediment was more aidespread and Hicken but removed by elosion. Coal Lease Coal leave in the target is situated on flat range land. The area enclosed by The Mase exhibits little occup though the pipeline that runs three property expored blocks of basic intrusives (gabbro). On the last side of the property shycling breccia and rescalar basalt was abserved is is probably the lower most section of the zoone volcanice. The property is probably not coal bearing due to I the glat chatter of the land with intensives being the only nocke Appe. 2) The area is at least 500' lower topographically than the redimentary sequence observed and one. Savana. It is possible -> cont,

that there is a possibility that some structural frature has dropped the area (but no volcanics) while observed) and collected sectiments, or that perhaps it could be an experience outline of seds (though absence of topography makes this unlikely) Recommendation is to cleck waterhole logs.

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TARGET # 44

I i) Dates Worked -- 1 crewday 13/6/82 (H-H) ii) Outcrop #'s -- NIL iii) Sediment Sample #'s -- NIL iv) Map Sheet -- 92 I/7 v) Photos -- NIL

II i) Traverse Description: Access moderate coverage from Logan Lake.

ii) Rock Types Encountered: Only one outerop of volcanic Nocks were found, next was all covered by overbundted.

iii) Description of Outcrop/Topography: Topography was flat i muddy and odcrop very rare. Target Summary Outcrep net visable on this flat III lard.



TARGET # 50

I i) Dates Worked -- 1/2 crew day, 10/6/82 (RB) ii) Outcrop #'s -- 20037iii) Sediment Sample #'s -- NILiv) Map Sheet -- 92I/2

v) Photos -- NIL

i) Traverse Description: Road traverse with access to the area from hwy # 5 south of merrit.

ii) Rock Types Encountered: Basalt, ganodiorite and conglomante

iii) Description of Outcrop/Topography: Topography was rolling, hilly land with the volcances found on persides, the intrusive on the top of a hill and the conglomerate in road cut Target Summary The only sediments found were III conglomerate and since autorop is so poor, possibility of finding recessive sediments is remote.



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TARGET # 51

I i) Dates Worked -- 1/2 onew day 10/6/82 ii) Outcrop #'s -- NIL iii) Sediment Sample #'s -- NIL iv) Map Sheet --92I/8

v) Photos -- N/L

i) Traverse Description: Road traverse with reasonable access from menite

ii) Rock Types Encountered: These included Escene anderites and Myslites mean Ste Diway, and became Triassic instancements of wither inland.

iii)	Description of O	utcrop/Topograph	y: Outcrap	was ypoor a	live to
	A	easy over	bunder.		
III	Target Summary	Outcrop	ypoor the	ufore stim	chance
III	Target Summary	Outcrop	poor the sasily	refore stim stathered	chance rediments
III	Target Summary	Outcrop	poor the sasily	refore stim seathered	chance sediments
III	Target Summary	Outcrop	poor the sasily	refore stim Stattered	chance sediments
III	Target Summary	Outcrep	poor the sasily	refore stim stathered	chance sediments
III	Target Summary	Orterop Ginding	poor the sasily	For travers	chance redimints e location taiget 38
III	Target Summary	Outcrop	poor the sasily	For travers	chance sediments target 38
III	Target Summary	Orterop Juncting	poor the sasily	refore stim Stathered p For travers See	chance rediments target 38
III	Target Summary	Outcrop	poor the sasily	For travers	chance sediments target 38

TARGET # 52, 53, 54 = 55

I i) Dates Worked -- / crew day, 26/6/82, (A.P.) ii) Outcrop #'s -- NIL iii) Sediment Sample #'s -- NIL iv) Map Sheet -- 92 I/13

v) Photos -- NIL

II

i) Traverse Description:

# 52 - Too remote - cno access # 53 - access was moderate - 1 road crossed The target area # 5# - access Ablocked and over grown. # 55 - Mo access.

ii) Rock Types Encountered: no outcrop of Eccene sediments were observed though there was a great above This was give red as was the sandy silt glacial material which was expected everywhere.

iii) Description of Outcrop/Topography: Outcrop, besides Pleistocene was very scarce.

Target Summary No Jutter work is warrented since three is an unlikely possibility of coal due to type and oxidized chattere of the sediment float. III



TARGET # 57

I i)	Dates Worked		1/2 crewday 23/6/82 (PB), I crewday 24/6/82 (AP)	
ii)	Outcrop #'s		R0054, R0055	
iii)	Sediment Sam #'s	ple 	R0054	
iv)	Map Sheet		92 I/11	
v)	Photos		NIL	

II i) Traverse Description: Target accessed of Huy #1 through ashcroft then using secondary gravel reads.

ii) Rock Types Encountered: Outerop consisted only of volcaniclastics and condomerates. One possil location was found . This was a fish fossil concerned in a finely lanirated Silica mart.

TARGET # iii) Description of Outcrop/Topography: Outcrop was very scarce, due to the gentle nature of the topography, and only occurred as road cuts Target Summary Only one sedimentary outcrep was found and due to the flat III charalter og the stand and resservice nature og Eccene sediments, yossibility of coal artorops is sare.



	TARGET	r# Coldu	sater B	leds So	uth of 5	pences	Bridge	 
C	I i) Da	ates Worked	- 1 014	and day	13/6/1	82 , ( <i>RB</i> )		
	ii) Ou	utcrop #'s	Roo	43				
	iii) Se	ediment Samp #'s	le	43				
	iv) Ma	ap Sheet	- 92 I	16				
	v) Pl	hotos	- NIL					

i) Traverse Description: Access to ten get by grovel road

ii) Rock Types Encountered: Except for the one sands tone outcrop of possible Eccene age, all rock incounted was volcame, such as basalt, volcandastic debris and welded tiff.

## TARGET # Coldwater Beds South of Spences Bridge.

Oglacial overbuden

found in a road out. Most outcrop was

iii) Description of Outcrop/Topography: Topography was very steep and the autorop was found on killsides except for the sand stoke and and

III Target Summary Though coal was reported in the area only sandstone was yound

92-I/6



1.1

I		
i) Dates Worke	ed 1 crewary, 23/0/02 comp	
ii) Outcrop #'s	HOOZZ	
iii) Sediment Sa #'s	ample s Hoozz	
iv) Map Sheet		
v) Photos	N/16	

II



ii) Rock Types Encountered: 9) Canglomerate. 6) Basallo

TA	RG	ET	#
	110	_	. 10

iii) Description of Outcrop/Topography:

1

III Target Summary



\*



TARGET # RED POINT

I i) Dates Worked -- 1/2 crewday 26/6/82 (R3)

- ii) Outcrop #'s -- 20058, 20059
- iii) Sediment Sample #'s -- ROOSE, ROOS9
- iv) Map Sheet -- 92 I/15
- v) Photos -- NIL

II i) Traverse Description: Traverse along side of Kamberset lake on new road Granching of of the Trangeille Cr. Rd.

ii) Rock Types Encountered: Basaltic volcanico overlying very Massimul Encene sidiments.

TARGET #

iii) Description of Outcrop/Topography: -Terraine consists of gentle polling Lills with the volcanics exposed conostly load cit. Target Summary These rediments are the Tranquitte bids and carried of sandutere sittstone; shale capped by la basaltic flew i it is goile probable that they continue under this cap. III



) I.	Deter Herbert	
1)	Dates Worked	2hrs 10/6/82 (R.B)
ii)	Outcrop #'s	- NIC
iii)	Sediment Samp #'s	le NIL
iv)	Map Sheet	-92 1/2
v)	Photos	N/11

II i) Traverse Description: Prod gravel road acces south from markit.

ii) Rock Types Encountered: all week Syperd whe volcance basalts and and with land Alustered Sectiments.
TARGET # EDGENE VOLDANICS SOUTH OF MERRIT. iii) Description of Outcrop/Topography: The country was gently Notling with volcamed occurring Target Summary Very close to concrit coal field though no sediments alle felad. III



Province of British Columbia Ministry of Environment

Water Management Branch Parliament Buildings Victoria British Columbia V8V 1X5

TOURFILE	0183613-C	
OUR FILE		

May 7, 1982

Mr. David Howard Esso Minerals Canada Coal Department 237 4th Avenue S.W. Calgary, Alberta

Rm.675

Dear Sir:

Further to your telephone enquiry of April 30, 1982, please find enclosed the following:

Index of Well Location Maps, Sheets 1 and 2

Kamloops District Water Well Location Maps, Sheets 21 and 68

If we can be of further assistance please contact our office in Victoria at 387-1115.

Yours truly,

J.C. Foweraker, Head Groundwater Section Water Management Branch 387-1115

DATA DISTRIBUTION SERVICES

MAY 1 3 1982

How

F. Chwojka Per:

Encl.

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ACT!^\*

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Province of British Columbia Ministry of Environment

Water Management Branch Parliament Buildings Victoria British Columbia V8V 1X5

YOUR FILE

OUR FILE . 0183613-C

September 10, 1982

Esso Minerals Coal Department Room 675 237 - 4th Avenue S.W. Calgary, Alberta T2P 0H6

Attention: Hal Hopkins

Dear Mr. Hopkins:

In response to your telephone request of September 7, enclosed please find well location maps you requested. Unfortunately, we have been unable to locate two of the maps you wanted, Kamloops Sheets 27 and 28. I have made a note of this, and when and if the maps are found, I will send you copies of them.

I am also enclosing an invoice for copying charges of this material.

If we can be of further assistance, do not hesitate to contact this office at 387-1115.

Yours truly,

J.C. Foweraker, Head Groundwater Section Water Management Branch

Per: Bartana Travers

Encl.



INVOICE NO. 51

GROUNDWATER HYDROLOGY SECTION WATER MANAGEMENT BRANCH MINISTRY OF ENVIRONMENT LEGISLATIVE BUILDINGS VICTORIA, B.C. V8V 1X5

T0: Esso Minerals Coal Department Room 675 237 - 4th Avenue S.W. Calgary, Alberta T2P 0H6 Attention: Hal Hopkins

REFERENCE: Your letter/ phone call of <u>September 7, 1982</u> wherein you requested well location maps as follows: Lillooett L.D. maps #52 & #53, Yale L.D. maps #3 & #6, Kamloops maps (#27 & #28 - missing - no charge), #30, #60, #65, 66, 67, 68, 69, 79, 80, & #100 and index of well location maps for east central and west central B.C. (3 maps)

	17 well location maps @ \$1.00/ea.	<b>\$</b> \$17.00
		_ \$
		_ \$
		\$
<u> </u>		_ \$
		_ \$

TOTAL \$ ....17.00.....

PLEASE PAY THE ABOVE AMOUNT

DATE: September 10, 1982

FILE: 0183613-C

MAKE CHEQUE PAYABLE TO THE MINISTER OF FINANCE, PROVINCE OF BRITISH COLUMBIA, AND RETURN WITH THIS STATEMENT TO THE GROUNDWATER OFFICE, HYDROLOGY SECTION, WATER MANAGEMENT BRANCH, MINISTRY OF ENVIRONMENT, LEGISLATIVE BUILDINGS, VICTORIA, B.C., VSV 1X5 Province of British Columbia Ministry of Environment

Water Management Branch Parliament Buildings Victoria British Columbia V8V 1X5

YOUR FILE

OUR FILE 0183613-C

October 22, 1982

Ms. Roberta Berg Coal Department Esso Minerals Canada Esso Plaza 237 Fourth Avenue Southwest Calgary, Alberta T2P 0H6

Dear Ms. Berg:

In response to your letter of October 14, enclosed please find all the well logs and most of the well location maps you requested. The reason why some of the maps have not been sent is that they have no wells plotted on them and hence it would appear they would not be of any value to you.

By the way, in a previous request (September 7, 1982) by Hal Hopkins of your office he asked for Kamloops map sheets 27 and 28, and he was informed at that time that they were missing and would be sent at a later date when found. I was not aware at that time that these maps had been removed from our system because they had no wells plotted on them. I would appreciate it if you could tell him this.

I am also enclosing an invoice for the copying cost of the maps.

If you require further groundwater information, do not hesitate to contact this office in Victoria at 387-1115.

Yours truly,

J.C. Foweraker, Head Groundwater Section Water Management Branch

Per: Bartona Travers

Encl.



INVOICE NO. 54

GROUNDWATER HYDROLOGY SECTION WATER MANAGEMENT BRANCH MINISTRY OF ENVIRONMENT LEGISLATIVE BUILDINGS VICTORIA, B.C. V8V 1X5

TO: Ms. Roberta Berg Coal Department Esso Minerals Canada 237 Fourth Avenue Southwest Calgary, Alberta T2P 0H6

REFERENCE: Your letter/ phanexeelt of October 14, 1982 wherein you requested

copies of well location maps in the Lillooet, Cassiar, Coast Range 5, Coast Range 4

and Kamloops Districts

 13 well location maps @ \$1.00 each
 \$ ......

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TOTAL \$ ....13.00.....

PLEASE PAY THE ABOVE AMOUNT

DATE: <u>October 22, 1982</u>

FILE: 0183613-C

MAKE CHEQUE PAYABLE TO THE MINISTER OF FINANCE, PROVINCE OF BRITISH COLUMBIA, AND RETURN WITH THIS STATEMENT TO THE GROUNDWATER OFFICE, HYDROLOGY SECTION, WATER MANAGEMENT BRANCH, MINISTRY OF ENVIRONMENT, LEGISLATIVE BUILDINGS, VICTORIA, B.C., VSV 1X5

			Phase I T	argets	M.S. 92H-92I			
			Priori	<u>ty 1</u>				
TARGET	MAP SHEET	GEOLOGIC REASONING	SIZE	EXPOSURE PROBABILITY	CREW ALLOTTED DAYS	ACCESS	DIST	BASE OF OPERATIONS
1	92H/2/7	EOSEDS ON EOVOLS	4 x 1¹₂mi					PR
3	92H/2/8	EQSEDS UNDER EOVOLS ON TRIAMETA	3½ x 1½mi					ÞR
4	92H/2/8	EOSEDS UNDER EOVOLS ON TRIAMETA	_4 x 1¹₂mi					PR
6(a)	92H/2/15	EOSEDS UNDER EOVOLS ON TRIAMETA	′7 x 1½mi					
6(b)	92H/2/15	EOSEDS UNDER EOVOLS ON TRIAMETA	17½ x ½mi					
27	921/15	EOSEDS IN EOVOLS	2½ x ½mi	mod	1	good		
28	921/14/15	EOSEDS IN EOVOLS	big		1			
30	921/15	CRET?/TERT? SEDS ON TRIMET	12 x 2mi	good	3	good		
31	921/15	POSSIBLE EOSEDS	big		5	good		
34	921/9/10	EOSEDS IN EOVOLS	8 x 2mi	mod-good	2	good		
41		EOSEDS IN EOVOLS	10 x 4mi	mod-good	2	good		
53	921/13	EOSEDS ON JUR. INTR.	3 x 1		2			
56	921/14	EOVOL	big		3			

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Princeton - Ashcroft

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Princeton - Ashcroft									
			Phase	I Targets	M.S. 92H	-92I			
			Pri	<u>ority 2</u>	ÓDEU				
TARGET	MAP SHEET	GEOLOGIC REASONING	<u>SIZE</u>	EXPOSURE PROBABILITY	ALLOTTED DAYS	ACCESS	DIST	BASE OF OPERATIONS	
2	92H/1	EOSEDS IN EOVOLS	2 x 1½mi						
10	92H/2/7	EOVOLS ON JUR. INTR.	6 x 13mi						
38	921/8/9	EOVOLS BETWEEN JUR. INTR.	8 x 4mi	poor-mod	2	mod			
43	921/7/10	TOPO LOW IN TRIMET/EOSEDS	4 x 4mi	mod	1	mod			
50	921/2	EOSED ON TRIMET	2 x ½		1				

		Prince	eton – Ashcroft				
		Pha	se I - Targets	M.S. 92	H-92I		
		-	Priority 3				
MAP SHEET	GEOLOGIC REASONING	<u>SIZE</u>	EXPOSURE PROBABILITY	CREW ALLOTTED DAYS	ACCESS	DIST	BASE OF OPERATIONS
92H/1	EOSEDS UNDER EOVOLS	4 x <sup>1</sup> zmi					
92H/8	EOVOLS ON JUR. INTR & TRIMETS	3 x 2mi					
92H/8	EOVOLS ON JUR. INTR & TRIMETS	3 x 2mi					
92H/8	EOVOLS ON JUR. INTR & TRIMETS	2 x lmi					
92H/1,2, & 8	EOVOLS ON JUR. INTR & TRIMETS	5 x 12mi					
92H/16	EOVOLS ON JUR. INTR & TRIMETS	7 x 3mi					
921/16	TOPO LOW IN CARBON META	6 x 4mi		1	good		
921/9	TOPO LOW TRIMET BETWEEN CR	3 x 3mi	good	1	good		
921/10	EOVOL ON TRIMET & JUR. INT	big	poor-mod	1	poor-mod		
921/8	TOPO LOW ON TRIMET	4 x 2mi		1			
921/13	EOVOLS ON CRET VOLS	5 x 3mi		1			

TARGET

			Prince	eton - Ashcroft				•
			Phas	se I Targets	M.S. 92H	-92I		
			Pi	riority 4				
TARGETS	MAP SHEET	GEOLOGIC REASONING	SIZE	EXPOSURE PROBABILITY	CREW ALLOTTED DAYS	ACCESS	DIST	OPERATIONS
13	92H/15	MIO VOL CAP ON TRI	3 x 1½mi					
14	92H/15	MIO VOL CAP ON TRI	5½ x ½mi					
15	92H/15	MIO VOL CAP ON TRI	2¹₂ x 3/4mi	i				
16	92H/10	MIO VOL CAP ON TRI	3 x 1 <sup>1</sup> 2	1				
17	92H/8/9	TOPO LOW IN JUR. INTR & TRIMET						
18	92H/9	TOPOLOW IN JUR. INTR & TRIMET						
19	92H/9	TOPO LOW IN JUR. INTR & TRIMET						
20	92H/9	TOPO LOW IN JUR. INTR & TRIMET						
21	92H/9/16	TOPO LOW IN JUR. INTR & TRIMET						
22	92H/7	TOPO LOW IN JUR. INTR & TRIMET						
23	92H/9/16	TOPO LOW IN JUR. INTR & TRIMET						
24	92H/16	TOPO LOW IN JUR. INTR & TRIMET						
25	92H/16	TOPO LOW IN JUR. INTR & TRIMET						
26	92H/10	TOPO LOW IN JUR. INTR & TRIMET						
29	921/15	EOVOL ON TRIMET	2 x 1mi	mod to goo	d 1	good		
35	921/9/10	TOPO LOW IN TRIMET	4 x 2½mi	mod to goo	d 2	good		

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		Pric	rity 4		CDEN		
TARGETS	MAP SHEET	GEOLOGIC REASONING	SIZE	EXPOSURE PROBABILITY	ALLOTTED DAYS	ACCESS	BASE OF OPERATIONS
37	921/8/9	EOVOL ON JUR. INT	4 x 2mi	mod	1	mod	
40	921/8	EOVOL ON JUR. INT	12 x 2mi	poor	2	poor	
44	921/7	TOPO LOW ON TRIMET NEXT TO BSMT. HIGH	10 x 2 <sup>1</sup> 2	poor	1 <sub>2</sub>		
45	921/7,8,9,10	TOPO LOW ON TRIMET NEXT TO BSMT. HIGH	3 x 2 <sup>1</sup> 2	mod	1	good	
46	921/8	TOPO LOW ON TRIMET NEXT TO BSMT. HIGH	6 x 2	mod	1	good	
47	921/1,8	TOPO LOW ON TRIMET NEXT TO BSMT. HIGH	3 x 3	mod	1	good	
54	921/13	EOVOL ON CRET VOL	3 x 1		1 <sub>2</sub>		
55	921/13	EOVOL ON PERM CST.	4 x 2		1 <u>-</u> 2		
57	921/11	EOVOL	big		1		

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DWR - DRY WEATHER ROAD! FRINCETON POSURE TIME (D) TARGET - GOOD ACCESS BY HWY 3 & D.W. ROAD V.GOOD SUNDAY CK 5K 1/2 DAY IF PICKED UP A TTHE END OF THE DAY EXPOSURE POSSIBUTY OF ROAD CUTS ALONG HWY & D.W. ROAD. 2 - POOR ACCESS (CART TRACK) MOD TOS. 1/2 ?? RIGHT ON TOP OF CRATER MAN. POOR TON. 3-V. POOR ACCESS HWY 2K AWAY SIMODI'S 2500' LOWER , D.W. ROAD 1/2 DAY TRAV. AWAY Mas To 6000 1 4 - MODERATE ACLESS ON SOUTH END. Two UNNAMED STREAMS. N/A N/A 5- INSIDE A PROV. PARK 6 - V. GOOD Access. MOD. ~6+8D. POSSIBILTY OF SPOTTING O/C FLOM ROAD & ROAD CUTS . MIGHT USE NUMEROUS CART TRACKS. Moo 1 - GOOD ACCESS D.W.R. BEST TO O PEAK TO CATCH 5 AC/DC CKS. 8 . 8 - Moo. Access. MOD. 2 GOOD, IAC/OC. STREAM 9. Moo. Acces. NO STREAMS BUT GOOD CLIFF MOD LOAY. Exposures ON WEST SIDE Upper FRIDAY CK. 10. GOOD ACCESS GOOD. South Access Poor GOOD IGOOD CK CUT COPPER (K (PARK BOUNDAY)

2006' = 700' MAYBE TONPP.U. DAY /15 MAS

1 DAY H

10.4

10

1/2

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11 - ACCESS TOOR. I DWR THRU MAN MOD IDAY. MIDDLE - ROAD TRAV. REST GOOD THE ACCESS. Z Days. 2 DAY 1 mop 12. Access GOOD TO NORT TO SOUTH MOD MOOTO GOOD 1 DAY 13 Access GOOD PEORTO MOD /DAY 14 Access GOOD NOD TO GOOD LOAY 15 11 11 6000 2/42DAS 16. Access 11 GOO I DAI 17. POOR ACCESS GOOD 2/12P. 18. POOR - TWO GOOD TRAV JUST OFF THE OUTLINE MOP Z.D. THEN ACCESS NOT BAD. MOD. ZD. 19. MOD. - TWO GOOD TRAV ID GOOD POOR TO MOD. - I GOOD CK TRAV. 20. MOD ID ACCESS MOD - 1 Good Cx 21 ZD GOOD FICCESS MOD-22 4<u>D.</u> MOD ACCESS GOOD 23 2D Access 6000 600D 24 27. 25 ACCESS MOD. MOD. 3D GOOD ACCESS 6001) 26 39 DAY = 20 DAYS. 24 DAYS.

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1073 Access LOAD SuitAL Princetor/March Marget Kmto: ~ 30 Hwy Pr. 1 N BOJAM Pr ... 121 Hwy 20-25 CART TIRCK 2 N 30 N 35 25KmHuy/6km LArttack. 26Km Hwy/8Km Drynonther fr, 3 Pr. 4 Within Catherrot Provincial Park. 5 n 20Km 13Km Hux to North endotting it the 2 30Km Allus - Degrate Thiomercuit these mer. 6 2 20 Km Pe. 7 15Km Hr / 6Km losse All with Jay with ~ 30Km PG NIDKM From Target#1 Access 8 n 25 Kn 9 Pr. 15 km Hwy /9 km/0000 0xyw / 2.5 km CAdlenet r 25Kn 25Kn Awy Pr 10 r 50km 40Km Hwy/ OKm Allweather / Digweather Pr. 11 25 Km Huy / 35 Km Gravel / Ory weath n 60km Merr. 12 ~ 25Km 20km hay / 7km CACT CRACK Mer. 13 ~ 35 m 30km toy 6km All rought Mec. 14 ~ 43 Km. <u>,</u>, 38km Hwy / 5 Km All weather Mer.  $\sim 10$  Km . GKm Loose Allweath/aryweath/2Km carttrack pr. 16

	rget Km	to Privade Mernit
17	~ 20 Km	Pr.
18	~ YOKu	Pr.
19	~ 25km	Pr.
20	~ 35Km	Pr.
1S	~ 50Km	Pc
22	~ 30Km	Pr.
23	~ YOKm	Pr.
24	~ 53Km	Mer
25	- 45km	Mer.
26	~ 40Km	Pr.
27	~ 65Km	Kmm.
28	-65Km	Kam
Z9	~ 74km	Kan
30	~ 60Km	KAM
2.1	~ 1 Km	KAM
32	n 22Km	KAM
33	within In	DIAN Reservation

2 of 3

ROAD Surface 1 Stmgran Allworth / 6 km cartfornek Yolan good all with Z kn dry verth 10Kn Hwy/10 Kngsmed /SKm cart th. 30 Km graudallworth/GKm carttk. 48 Kngrow Allworth a.Km cart tK. 20 grand Allworth / 10km drywenth. 40Kmgrand Allweath . / 3Km dry weath. 38 Kn Huy/15 Kn dry verth 30km Havey / 15km drywenth 40 Km granel All weather. 54km Hwy/ 10km All verthe grow 54km Huy / roken All areathorgend 54KnHuy/ ZOKn grand Allweather 46KnHwy/ 15 Kngrend allworther

Hay ZZKM Hwy

3.E 3 KAMLOOPS ROAD Surface Origet Km to Princelof Merritt n 2 Km Hwy KAM 34 ~ 14km 12KmHuy/2Kn dryumther KAM 35 ~ 17km Hwy Kam 36 ~ 2BKm 23km tuy / SKm dryweather. 37 KAM ~ 14 Km Hury 38 Kan 39 40 ~ 56Km Kom 20Kn Hwy/33Km All worth/3Kn KArth 41 ~ 23 Km 20km Huy Skin Allwatta KAM 42 ~ 45Km. Kmm 35Km Hwy/10Km All worth 43 n 36Km Mer 36Knffwy 44 ~ 40 km KAM 35 Kn Huy/5 Kn Cost +K. 45 ~ 25Km 25km Hwy KAM 46 - 35Km 35Km Hury Mer. 47 - 45 km 48 - 45 km mer 35km Hwy/ 10Km All wenthe 35Kn Hwy/ 10 Kn All werthe mer 49 - 47Km 35Km Hary/ 10km Allwenth / 2km dy mer 50 ~ 15km 51 ~ 35 km 12Kn Huy/ 3Kn drywenthes gets you ~ 1Kn Front nget from 35Kn.H WY mer. KAM

Approx Km to KAMbaps Poincetor/Merritt Access ROAD Surface Throe 115 Km Husy/10Km Allweather ~ 125 Km Kom 52 ~ 107 Km 53 10.5 Km Huy/2 Km cart tok. KAM. ~ 105 Km 1051km Huy .5 Km off Huy 54 KAM. 85 Km Hury/ 10Km CARTYCK. ~ 95 Km 55 KAM ~ 50 Km 50Km Hwy 54 KAM n 60Km 57 KAM 58Kn Hwy/2Kn Allacithe. ~ 2 5Km 58 mer. 25km Hwy





MOCENE



PRIORITY #3 1.11 廿 COPI CORY SA #2 IOF #4 PRINCETON 12 OF M.S. 92H GEO MAP 888 A PRIDETY 1 121314 ACCESSI CUTS M REASON. TARGET GOOD EDGENE SEDS ON EDGENE VOL Hmit /2 1 DAY 1 P. ROAD CUTS 7/2 5K /2 DAY 11/2 DAY 2 1 to SEDS IN EOVOLS ON PALEOZOIC BENT 2mix 1/2mi FOSEDS UNDER EO VOLS ON TRIP META : 1 1/2-10AY 3 8 JUR. INT 31/2 × 1/2mi 1DAY 4 AS ABOVE HMIX /1/2Mi 8 1 EOSEDS UNDER EOVOLS ON TRI MET : JUR DAY 5 IN PROV. PARK INT. Vzmix Hmil 15 6 DAYS 6 Eoseps/some of ON MOSTLY TR. MET  $\checkmark$ Some JUR INT & CRET YOL. a) 7m, × 1/2mi b) 17/2mi × 1/2mi 8 FO VOL ON JUR INTR. JMIX ZMI Eavor on " TRIMET 3mirzm. ZOAY 8 8 V 8 Eo Vol on " 9 " " \* 2m x fm; SOUTH MOST 14 IN PROV. PARK Gmix 13mi 2/71 EO VOL ON 2DAYS 10 2:8 1 DAY 11 5 .. x 12 ... T. . . . 2 DAYS 12 16 11 11 - 11 7m. × 3m. 3 DAY 13 15 Mio Vor CAP ON TRI 1/212 × 3ml 1/2 mi × 5/12 mi 1 DAY 14 11 11 15 1 3/4mix 2/2 mi 11 11 10Ay 15 15 11 11 1 3m. X/2ml 10 11 11 16 En 43 CREW DAYS #1- 10 DAYS #3-6DAYS 21/2 CALENDER DAYS #2 - 10 DAYS \* 4-17 DA15

Mary Hory

PRINCETON 1/2 OF M.S. 92H 2 OFZ GEO MAP 808A



TT& H PRIDRITY COPY APRIL 3 28/82 NICOLA 1/2 OF M.S. 92-I 1 OF Z 4 MAP 886A GEO REASON , 2, 3, 4, ACCESS ILCK (UTS TARGET EOSEDS IN EO VOL. 1/2 MIXZ/2mi IDAY 2.7 POSSIBLE EO SEAS IN EOVOL BIG. 1DAY 56 + 28 ON ASHCROFT EO VOL ON TRI MET / MIX 2M. 29? 15 1 1 DAY CRET? TERT? SEDS AN TRI MET 12×2mi 15 30 3DAYS POSSIBLE EDSEDS BIG 15 31 5 DAYS Topo LOWIN. CARBON META 16 32 1DAY 4×6mi 82 . 11 3/3 EO SEDSINEOVOU BX2m. 950 2 DAYS 34 1510 Topo how IN TRI MET - DAYS 35 "H × 2/2, ml Topo Low TRI MET SANDWICHED, 1 9 36 DAY BETWEEN GR 3×3mi 89 37 IDAY 1 188 ES KOL SANDWICHED BETWEEN JUR IN. 38 2 DATS 8mx +mi EO VOL ON JUR INT. 4×2mi 34 V 8 81 11 11 ? 12×2m2 V 40 918 Eo SEDSIN Eavor # ~10×4 mi 41 ZDAYS 10 EOVO ON TRI MERE JUR INT. BIG V 42 IDAY 1017 TOPOLOW IN TRI MET/SED SHOWING DAY + H3 XV 4x 4mi 7 Topo how ONTRI MET, NEXT TO BSMT HI 44 V 12 10x2/2mi #1- IHDAYS #3 4DAYS CREW = 15/2 CALENDER DAYS 31-DAYS ITZ-4 DAYS # 4 9DAYS

HEH APRIL 28/82 NICOLA 12 OF M.S. 92-IZOFZ GEO MAP BEGA 0 TARGET 1, 2, 3, 4 ACCESS CKCUTS M. REASON 78, Topo Low IN TRI MET OFF JURINT. HIGH DAT 45 3×1/2 m: IDAY 46 x ... ( . . . . . . . . Y 8 6×2mi 1' 11 & CARB MET OF JUR INT. IDA/ SA & X 168 11 11 . 3×3m 1878 IN CARB MET OF JUR INT. 1 11 3×3m. EO VOL ON CARBMET & JUR INT. 12-349 1×5mi EOSED ON TR. MET ~ IDAY 50 2 ZXV2mi C 10A 51 TOPOLOW ON TRIMET 4×2mi 8

PRIORITY 3 MAY4/82 HEH COPY 4 ASHCROFT M.S. 2 1010 A , CK CUTS . ACCESS REASONS. TARGET 1 1 1 EO VOLS. ON CRETUDE. IDAY 52 3×5mi 2 DAYS 53 E. SEDS. ON JUR INT. 1 1 × 3m. 12DAY 54 E. VOL. ON CRET VON. 1× 3mi V EOVON ON PERM LST 55 1 2×4mi Ro Vor - Vi Big. 3DAYSEE 56 V EO VOL - V. BIC. IDAY 57 1/ SED - Hanxismi 58 CREW DAYS & DAYS CALENDER DAYS = 41/2 DAYS. #1 5 DAYS #2 0 # 3 DAY 3DAYS #4

Palao Somple . Record Sheet

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DAMPLE &	*	Cate!	1 .	/0	4	EAST	NORTH	DESCRIP	TION	SENT
10001	a	10	4	6	84	675900	54 57700	Pales -	Volcanoclastic which	No
Rooo	6	10	1	6	82	4		Palao a	arby (wood - coal?) mutario	R 11/06/
ROODZ		0	1	6	82	650500	5480900	Paleo -	this stringers in Very cg	V
Roomia		10	2	6	82	676200	5461900	Pales -	- matrix of congl.	VX
R0024	a	11	3	6	82	682600	5450150	Pales -	matrix of congl.	VI
R00 24	6	u	3	6	82	4		Paleo	- 35t	V
20025	a	u	3	6	82	684800	5449900	Pales	- sst i cooly wood from	V
R0025	6	u	3	b	82		4	Pales	- sat 03	1
R0025	C	"	3	6	82	1.	"	Dalo	is wood first + sat + some uni	coaly
R0027			3	6	82	686500	545095	Pales	matrix of correl	Pues
20018			3	6	82	679000	5451200	Palie	- arcillite - Nicola?	No
2003/		4	4	6	52	1209800	54 79/00	Paleo	- Vary unvonsolidation	2 NO
V Ronza		12	11	6	8z.	65 3750	5613000	Pales	- Siltstone Pleistocene?	V
mania	1	42	11	6	97	553800	5616800	Pales	- sandstone	11
DOWNE		20	1	,	00	-2500	56322500	D. lan	- shill feat of The	No
Ropula		21	16	6	67	648220	5644950	Delles	- continue treit	No
000415		21	16	0	04	64 7200	5647600	Della		110
Durt T		20	16	6	52	1412850	51421-1	Pales	and a shele	Ver
ROUG D		20	110	1	07	1170-	3673130	ince o	- sol sharey	Jes.
10011		20	14	0	0-	647500	5643100	Files	- 35t - Shace - CEGI	NO
R0051	1.	21	14	6	84	642450		Fales	- conglo matrix	No
120034	Mari	PC	17	24	TO TO	641750	2046 200	Palleo		No
		100	-1	11 -2	8					Ver
20043	1	1 Security	13	6	82	557970	6179 500	Paleo	- 35t :	Jus
ROOHH	1-	31	15	6	82	673150	5623500	Paleo	- 55+ "	Jes .
R0054		57	23	6	82	634900	5 6 20 500	Pales	- tullaceous sot	No
R0055	1	57	23	6	82	635300	5620450	Pales	- 557	No
R0056	9	ceres	24	6	82	301300	5614600	Paleo	- 551 -	YES
4.55	6	.H		:17		298900	5601600	Paleo	- SST + CONGLO MARY.	NO
R0057		42	26	6	82	654300	5519800	Paleo	- SST - NICOLA FLOAT	No.
R00 56		Torner	26	6	82	66 5700	5525700	Paleo	- SHTETONE + SST	yes
Dec 59		10	21	1	02	4 5300	8+21200	Pal.		.1.

0 10 31 12 18 14

SAMPLE FOR

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				PALE	ε0.				
SAMPLE #				UT	m				CHECK
OUT CRO	(# 9	TARGET	DATE	EAST	NORTH	DISCRIPT	NOI	1	SENT
H0004	9	1	06/01/82	675900	5457650	CONS MA	atrix	(LOP)	11/06/81
40004	6	1	06/01/82	675900	5457650	sst	(	bottom)	N
HODOS		1	06/02/82	677400	5459500	CONG MAT	rix		1
H0006		1	06/02/82	677600	5459600	sst			V
H0007		1	06/02/82	676750	5458750	sst			1
H0008		1	06/02/82	677650	5459550	557 222			11
40010	a		06/02/82	679300	5458250	cong matr	ix (	(boffar)	0
40010	6	i	06/02/82	679300	5458250	DiAtomAtious	CLAY	(top)	V
40011	a	11	665382	681500	5448000	sst. slt.	(botton	n)	V
HOOL	6	III	06/03/82	681500	5448000	silt.	Ltop	)	1
H0012		11	06/03/82	681500	5447150	sst			1
H0013		11	06/03/82	681850	5445 850	Sst			V
HONY		ii	06/03/82	682150	5445450	SST			V
40015		101	06/03/82	678200	5453250	sst			1
H0017		Z	06 04/82	716600	5453350	cong with.			V
Hopia	1	11	16/06/82	400500	5447600	CANTO MATRIX			V
11.23			001-140	41100	- 1 1 10 00	-see renerces			
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	2	25	1	01404182	11745 0	5150									

Photograph Record Sheet -Bt. Recon L.G. FRIT UTM Ron DATE 9c Torget DESCRIPTION NORTH D m EAST 7 carby-wood in de of volcanoclastic R0001 3/ 05 82 10 L1 12  $\mathbf{h}$ photo of ROOOL ve - volcanoclastic 13 ч. attempt to show contact H MOOL and 14 ł. 68 050 548090 trough X-bed. H0004 (cg1) 15 hotel behind hat

Photograph Record Sheet -Bt Recon - R.B. UTM BOTT EKW DATE 0/0 DESCRIPTIÓN TARGET . NORTH FDIM,Y EAST 2 09 06 82 6 59 800 553050 CONGLOMERATE 16 R0034 6 3 5643150 Roo45/6 0682 30 647850 CONGLO OUTEROP - OVERVIEW 8 8 3 11 30 11 7.1 BRGHANICIBED BIT 11 SST 3 LOG IN CONGLO MATRIX 10 Et at10 it3 5601600 SEDS UNER MODIE 100 56 21 06 82 29 5900 19 VOL CAD CREEK 11 6 3 20

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IOF2 JUNE3/82 HH TARGET # 1 BASE OF OPPERATION. - PRINCTION. MAP SHEETS - 92 H/2, 92 H/7 DATES WORKED - 2HRS - 2CREWS JUNE! (H.H. & R.B.) - ICREW DAY JUNEZ (H.H.) - 2HRS - ICREW JUNE3 (H.H.) NUMBER OF O.C. - HODOY TO HODIO, HODIS, HODIS " OFSEDS - ALL " PALEO SAMPLES- HOOD Ya, b, HOODS THRU HOODS, HOOD a, b, HOOIS 11 OF PHOTOS - 10 DISCRIPTION OF TRAVERSES. -JUNE 1,82 H.H.S.R.B. DROVE HWY 3 SOUTH TO O.C.S # HOOOH ER0001 - JUNE 2, 82 H.H. & D.H. WALKED FROM HWY3 EAST TO VEWAY DOWN SUNDAY CK. - JUNE 2,82 H.H. & D.H. DROVE DOWN RD WHICH RUNSILL TO CK - JUNE 3,82 H.H & D.H DROVE NORTH FROM TIP OF MANNING PROV. PARK ALONG HWY 3 DISCRIPTION OF ROCK ENCOUNTERED - ALONG HWY 30 THE SED. TO THE NORTH IS A COASE MATRIX ROUNDED LOBBLE CONG ASSOCIATED WITH GREEN ANDSITIC SOURCE RK LITH SST WITH RARE TO OCCASSIONAL GARBY WOOD FRACES RANGING FROM 3cm TO 40cm IN LENGH. AS YOU DRIVE SOUTH YOU ENCOUNTER SECREPHETS OF OK WHICH ARE UP SECTION. AS you GO UP SECTION THE COBBLE CONG DISAPPEARS FTHE SST BECOMES MUCH MORE MATURE. ROUNDED TO SUBROUNDED MEDIUM GRAIN MASSIVE SST. / SOME GRANULAR TO COARSE SST. STRIKES & DIPS ARE RARE BECAUSE OF THE MASSIVE NATURE & RECESSIVE NATURE OF THE SEDIMENT. - O.C. ENCOUNTERED ALONE SUNDAY CK & KOAD. WAS PREDOMINATELY LOWER SECTION CONG. & WAYDBY THE SIMILAN MEEN WE FOUND ONE D/C OF DINTOM CNAY ON CONG. - THE LOWER 1/2 OF SUNDAY CK WAS ALL VOLCANIC. ANDESITE

ZOFZ TARGET #1 DISCRIPTION OF O.C/TOPOGRAPHY FOVERBURDEN. - O.C. OCCURRED ALONG CK CUTS & ROAD CUTS I.C. THE LIKELYHOOD OF FREE STANDING OK IS VERY MINUTE. - TERRIAN FROM HWY3 TO SIMILKAMEEN IS STEEP AND ROUGH WALKING DUE TO DEADFALL - THE OVERBURDEN VENURE APPEARS THIN EXCEPT THE UPSTREAM ON THE CKS WHICH HAVE CONCENTRATED TILL THICKNESSES. OF ACCESS. DISCRIPTION - Access IS QUITE GOOD WITH BAWY3, THE ROADS DOWN TO THE SIMILKAMEEN ARE DRIVEABLE, SOME AREAS MAY GET QUITE WITH BUBSTANTIAL RAIN. SLOPPY COMMENT ON THE EXTENT OF SEDS. I BELIEVE THE SEDS FALL WITHIN THE GSC MAPPED AREA, I THINK THESE SEDS WILL BE DIRECTLY CORRELATED / THOSE IN AREALL & AIMILKAMEEN LATER ERODED THRU THUS DISCONNECTING THEM. I THINK A TRAVERSE TOOWN SATURDAYCK COULD YEILD SEDS BUT PROBABLY NOT COAL

IOFI JUNE 4/82 TARGET #Z BASE OF OPERATION - PRINCETON Maps SHEETS - 92H/1 DATE WORKED - EARLY AFTERNOON JUNE 4 (H.H. & R.B.) Nomber OF O/c - HOOIT & HOOIB " OF SEDS PALEOSAMPLES - HOOIT 1) PHOTOS - Z DISCRIPTION OF TRAVERSE - DROVE UP THE CART TRAIL (IT WAS A STEEP ROAD (COOD EXPOSURE). DISCRIPTION OF ROCK ENEOUNTERED - THE LOWER THIRD WAS ALL ANDESITE OU. - THE MIDDLE DORTION YEILDED CONG. EOCEM O.C. - COBBLE 2cm TO 20cm / ANGULAR LITHIC MATRIX - THE UPPER PORTION WAS ALL VOLCANIC. DISCRIPTION OF O/C /TOPO/ OVER BURDEN. - ROAD GUTS O/C CUT THRU CUP SECTION) - LOWER DOWN THE ROAD THE PLIESTOCENE SEPS LOOKED ALOT LIKE THE E OCENESCONIC, EXCEPT IT WAS NOT CONSOLIDATE GOVERAGE 15 SUFFICENT

BASE: PRINCETON

June 4th L. Goldberg Summary - Target area \*4 I i DATES WORKED : I crew day by R. Berg and L. Goldberg ii Outrops : Number 31 ici Sediment Shows Ole #31 tertiary is (pleistocene?) iv Samples Paleo sample 0031 V Map Sheet. 92 H/8 i traverse description; Road traverse up logging road 3/10 km cust of Stemwinder Prov. Park, South to Mc Nulty Creek. Stream recon, also done, Rock type - Nicola Group; Volcanics, Argillite, limestone LC - Coast Intrusions ; Granik, Quartz Monzonike - Eocene - Unconsolidated sandstone (pleistocene) Volconics. (basalts) ici Description of Outcrop - Outcrops were rarely found on road cuts. Most outcrops were on hillsides with talus, Area was neavily covered by till, and no outcrops of interest 111

were seen. Eocene sediments mopped by the GSC were not

found. Possibility for coal occurence is very slim.

TARGET #6 JUNE 10/82 R. BERG PATES WORKED - JUNE 9 & 2 HRS ON JUNE 10 1 OUTCROPS - ROO32 - 35 SEDIMENT SHOWS - 33 - 35 - CONGLOM ERATES SEDIMENT SAMPLES - NONE MAP SHEETS 92H/15 2 9272 PHOTOS - CONGLOMERATE O/C AT ROO34 TRAVERSE DESCRIPTION - AREA WAS EASILY REACHED OFF HIWAY #5 SOUTH FROM MERRIT - MOST WAS PONE BY ROAD BUT 2 KM WAS ON FOOT DUE TO ROAD BLOCKAGE. ROCK TYPES - VOLCANICS, VOLCANICLASTICS AND VERY COARSE CONGLOMERATES CONSIDER-ED TO BE OF EDGENE PIELE, TILL WASVERY DESCRIPTIONS OF O/C - TOPO - TOPOGRAPHY WAS CONSIDERED GENTE AND THEREFORE O/CWAS SCARCE AND, WHEN FOUND, QUITE SMALL IN EXTENT, I COVERAGE OF THE AREA WAS QUITE EXTENSIVE BUT ONLY CONGLOMERATE WAS FOUND.
BASE: PRINCETON

TARGET AREA 10 - SUMMARY JUNE 3/82 RL BERG I DATES WORKED - I CREW DAY JUNE 2 BY L. GOLD-BERG & R. BERG, ALSO I CREW DAY-WOUTCROPS - NUMBERS 1,3-15 ASO HEH I-3,450 WISEDIMENT SHOWS - ONE JED. JHOW - OUTCROP #15 WISEDIMENT JHOWS - ONE JED. JHOW - OUTCROP #15 WISEDIMENT - ROOIS - PALED. FROM MATTRIX OF CONGLOMERATE OF OUTCROP #15 N MAP SHEET - 92H/7

JI THE AREA WAS ORIGINALLY MAPPED AS EOCENE VOLCANICS AND THIS WAS WHAT WAS FOUND EXCEPT FOR ONE CONGLOMERATE SAACHALLY ASSOCIATED WITH VOLCANICS. THIS CONGLOMERATE HAD LARGE ROUNDED CLASTS OF VARYING COMPOSITIONS AND SZES AT OUTCOP #AS. A TOFF, INTERPRETED AS BEING WATER LAIN, WAS POUND AT OUTCOP # 13. COAL & OTHER SEDIMENTS ARE NOT LIKELY TO BE FOUND'IN SURFACE OUTCROP AS EXPOSURE IS GENERALLY POUR. TRAVERSES OF SATURDAY CREEK, AREAS WEST OF HIWAY 3, AND THE SOUTHERN AREA (WHERE ACCESS IS AWAILABLE) MAY TURN UP MORE SEDIMENTS. ESPECIALLY SATURDAY CREEK WHICH IS VERY CLOSE TO TAKET AREA #(). BASE : PRINCETON

DECENE SEDMENT OUTCROP INCLUDED CONGLOMERATES (SOME VERY BADLY WEATHERED AND GOSSEN Y.). OUTCROP #25 WAS VERY RECESSIVE AND INCLUDED A FINE GRAINED SANDSTONE WHICH HAD INCORPORATED COALY WOODY FRANSMENTS. ONE VERY HARD QUARTZITE WAS FOUND AND IS OF QUESTIONABLE EXERNE AGE. MORE OUTCOOP OF EXERCISE SEDS IS LIKELY IF NEW ROAD CUTS ARE MADE BODIE TO ITS RECESSIVE NATURE, IT PROBABLY COULD NOT DE COCATED MUY OTHER WAY.

1. JUNE6/82 TARGET #11 DATES WORKED - Z CREW DAYS BY H.H. (D.H. JUNE3,6 - HOOII to HOOIH \$ HOOI9 OLC NUMBER SED SHOWS - ALL SAMPLES - Noo11a, 6; 12, 13, 14, 19 MAP SHEETS - 92H/52

TRAVERSE - DROVE DOWN LOCCING ROADS ON THE BREAT ROCK SIDE OF TARGET II. THE ROADS WERE 0.6/ TOPO EXCELLENT (ON JUNE 3/82) ACCESS DUNE 6 WE APPROACHED TARGET II. FROM COMMENT ON EXCELLENT SIDE, MOST OF THE ACCESS TO DE SEDS IN THE AREA PROPER WERE WASHOUT 6000 KM OFF THE ACH NOLA ROAD

THE BOOK ENCOUNTERED - ON THE WEST EDGENEVOLS + THE UPPER CONTACT OF A SEDIMENTRY ENCOUNTERED, IT CONSISTED OF SST \$ SILT ST TOPPED BY A RHYOLITIC VOLCANIC FLOW,

I BELIEVE THAT I'S SEDS IN 11 WERE ONCE ONE UNET SANDWICHED BY VOLCANIES IN 11\$10. IT WAS LATER BISECTED BY THE SIMILARAMEEN R.

SUMMARY - TARGETS 14, 15 + R4 (PHASE I) LINN GOLDBERG CA JUNE 9/82 I WORKED: I crew day by H.H and L.G.; June 9, 1782 (ii) No outroops mapped since no sediments were found. No samples (iii) MAP SHEETS; targets 14+15 are on 92/H15; larget 24 is an 92 H/16 (iv) No photos were taken. I TRAVERSE DESCRIPTION -Road traverses were done on loose surface dry weather roads through all three targets. Access was excellent on target 24, with numerous logging roads branching off the main gravel road, Road courage of target 15 was adequate but that of 14 was poor. Target 25, west of #14 was inaccessable "due to overgrowth. - Outcrops consisted mostly of roadcuts, but also occured along hillsides. Trenches duy on target # 24 exposed basic volcanic rocks. Exposure on all targets was poor due to a heavy cover of drift. Topography was hilly. - ROCK TYPES - R NICOLA GP. - Dosalts I COAST INTRUSIONS - diorite. K KINGSVALE G.P. - Volcanie breecia -Mis PRINCETON GP - ondesile, busalt, III - Since no sediment was found in this area, prospects for cool desurences are poor.

DONE JUNE 4 WRITTEN JUNES TARGET 16 1 OF DATE WORED - AFTERNOON OF JUNE 4/82 (H. HED. H) MUMBER OF CREW DAY - 1/2 CREW DAY # OF O/C - No O/C # SED SHOWS - No SEDC. # OF SAMPLES - No SAMPLE # OF PHOTOS - NONE. - ROAD TRAVERSES ALONG VARIOUS ROADS IN AREA - THE ROCK ENCOUNTERED WERE VOLCANCE (RHV. ANDE BASANT. - THE UPPER RUNDS VEILDEN NOTHING BUT OVER BURDEN. NO FURTHER WORK IN THIS AREA NEEDED THE ROADS WERE EXCELLEN

or JUNE 5/82 TARGET #26 DATE WORKED - JUNE 5/82 (H.H.) NUMBER OF CREW DAY - I CREW DAY # OF O/C - NONE 4 OF SEDS - Nove # OF SAMPLES - NONE # OF PHOTOS - NONE - DROVE ALL ROADS ACCESS WHICH WERE DRIVABLE - TRIASSIC METASEDS WITH A HEAVY VENTILE OF OVER BURDEN. 100% LOGGING AREA SO ALOT OF BAD ROADS. NO FURTHER WORK NEEDED.

SUMMARY - AREAS 23, 21 \$18 JUNE 5/82 RCBERG I DATES WORKED - JUNE 5, ONE CREW DAY BY LGOODBERG \$ R.BERG OUTCROP - NO SEDS ... NO OUTCROP #'S SEDIMENT SHOWS - NONE SEDIMENT SHOWS - NONE MAP SHEETS - 92H 9 \$16. I TRAVERSE DESCRIPTION - ROAD TRAVERSE - ACCESS FROM PRINCETON ON HIWAY 5.

FROM PRINCETON ON HIWAY 5 TO THE TEPEE LAKES CORNER (SECONDARY ROAD TO SUMMERCHAND.) FROM THIS ROAD, LOGGING TRAILS & CART TRACKS WERE TAKEN. ROCK TYPES - ONLY GRANITES - SOME QUITE SPECTACULAR CONTAINING CARGE PHENOCRYSTS OF K-SPARE DESCRIPTION OF OUTCROP - EXPOSURE QUITE GOUD ALONG ROAD LUTS.

I MADDED BY THE GSC AS INTRUSIVES & THIS WAS WHAT WAS FOUND. NO SEDIMENTS EXCEPT PLEISTOCENE, WERE SEEN.

JUNE 20/82 TARGET 30 R. BERG I DATES WORKED - JUNE 16 BY L GADBERG & RBERG. 17 - 1/2 DAY SHALE & LMST OUTEROP - ROD4/5 -& ROONS - PALED 120047 - CONGLOMERATE E SS 55 ROD-/8-PALED . ROD-17-PALED 120048 -ROD49 - 55 & SHALE ROO49 - PALEO MAP SHEET - 921/15 PHOTOS - RLB ROLL 3 FRAME 8 - OUTCEOP VIEW 9 - ORGANNIC LAYER 10 - 606 IN 55 5 CONGL MATRIX. I TRAVERSE DESCRIPTION - ACCESS ALL BY ROAD. ROCK TYPE - SEDS - SOME OF QUESTION MELE CRETACEOUS AGE, O/C-TOPO - EXPOSURE RANKES FROM GOOD TO POOR \$ 15 FOUND BY ROAD CUTS. TOPO 15 QUITE HILLY WITH DEEP-STEEP VALLEYS I AREA TO SOUTH COULD BE COVERED AS IT WAS NOT LOOKED AT. SMALL UOLCANIC UNIT TO THE WEST (in Target 28) TO THE WEST (I TARget 28) OF # 30 WAS LOOKED AT \$ DISCOVERED TO BE VOLCANIC. 17 - JUNE THIS DAY I TARGET ZZ WAS ALSO LOOKED AT ? WAS O/C # ROOS3 - HODDODS OF EDCENE SEDS. O/CH ROOSI PLOTTED IN TARGET 28 BUT 13 OF SAME ROCKTYPE AS 53 AND A PALED SAMPLE TAKEN. ROOSI - P.

JUNE 20/82 TARGET 31 R. BERG I DATES WORKED - JUNE 15 - ROAD TRAVERSE BY L GOLDBERG & R BERG UP THE TRANQUILLE CREEK ROAD. JUNE 18 - STREAM TRAJERSE BY SAME DOWN WATCHING CREEK ROOHY - 55 AND CONGLOMERATE -TRANQUILLE DUTCROPS ROO 46 - CONGLOMERATE ROOM6-PALEO MAP - 92 =/10 & 92 =/15. I TRAVERSE DESCRIPTION - ACCESS VERY GOOD UP THE TRANQUILLE OREEK ROAD. WATCHING CREEK ACCESSED TROUGH THE BATCHELOR HILLS ROAD. ROCK TYPES - TARGET 31 MAPPED AS EDCENE VOLCANIES VOLLANICS & AGGLOMERATES WERE THE ROCK TYPES DOMINATELY FOUND. A SMALL O/C OF TRANQUILLE BED SEDS WAS FOUND AND ANOTHER CONGLOMERTE CLOSE TO THE CRETACEOUS TARET #30, AND 15 OF QUESTONABLE AGE . TOPO / DIC - TOPOGRAPHY FANGES FROM STEEPS TO + THE O/C EXPOSURE FLAT FROM GOOD TO POOR RESPECTIVELY. TT AREA SEEMS TO BE MOSTLY VOLCANIC- MOST O/C WAS SEEN ON STREAM TRAVERSE & WAS ALL VOLCANIC IN ORIGIN. MORE WORK COULD BE DONE TOWARDS THE NORTH IN THE ATOINING MAP SHEET. SEE LARGE MAPOF 92I/15 FOR TRAVERSE LOCATIONS

JUNE 20/82 TARGETS 32 \$ 33 R. BERCH By R. BERS 5 DATES WORKED - JUNE 19 T L. GOLDBERG. OUTEROD - NO SEDIMENTARY EDCENE ROCKS FOUND , MAR SHEET - 32 - 921/16 33 - 92 I/9 I TRAVERSE DESCRIPTION - RECESS BY ROAD COVERING MOST OF 32 . PARTS OF TARAET 33 INACCESSABLE DUE TO INDIAN RESERVATION. - ROCKS ENCOUNTERED IN BOTTY POCK TYPES TARGETS WERE PALEOZOIC OF THE CALHE LREEK GROUP. 0/C - TOPO - GENTLE HILLY LAND WITH GOOD EXPOUSURE ON HILLSIDES. POSSIBLE I NO SEDS OFA EDCENE AGE WERE FOUND.

TARGET SUMMARY, #34,35

I DATES WORKED: 1/2 crew day by D.H. and L.G. No outcrops, no sed. shows, no samples, no photos MAP SHEETS: 92 I/9; 92 I/10

IF TRAVERSE DESC. - Access was hampered by "no unauthorized personnel" roads surrounding the mine. Away from the mine, access was very good on the trans Canada, and on 2<sup>ry</sup> gravel roads. - Exposure was adequate along highway, and poor to moderate along gravel roads. Topography was gentle and rolling. Rock TYPES - TARGET 34 - Tertiary volcanics; flow breccia + conglomerate - eocene seds were not seen as dicess was blocked by the mine, and city development. FARGET 35 - Triassic basic volcanics, also chloritic schist in Floot.

Permission should be obtained to travel on unauthorized roads in order to sample and date tertiony sediments mapped by the GSC. The sampling would take less than V4 crew day, since the target is so close to Kamloops.

TARGETS 46,36,37, NO PHOTO'S, OK#, SAMPLE. DAYS WORKED - I CREWDAY HHEDH DATE JUNE 11/82 WIDE OPEN SAGE BRUSH PLAINS / SOME FORESTED AREAS AROUND 37 ENCOUNTERED NOTHING BUT DVERBURDEN NO O/C SEEN. ACCESS GOOD - MAINLY RANGE ROADS.

#40. TARGET#41 AND MONTE HILLS ·SUMMARY -Lynn Goldberg DATES WORKED: 2 Crew days H.H.T.B on June 24; L.G. + R. B on June 25 SEDISHOWS : RODS6 a + b SAMPLES : ROOSE a. b MAP SHEETS , 921 8 ; 921 9 PHOTOS : ROLL # 2 R19; R20 of 0/c R0056.6 ACCESS : Access on target #41 was very poor, Only the west half of the target area was covered. Throughout the Monte Hills region access was excellent via well kept logging roads and powerline trails. ROCK TYPES : Rock seen were "Tertiary volcanics consisting of basalts, andesites rhyolite, flow breccia, and clebris flow. A biotite granite was mapped on "monte Hill". ROO56 outcrops, consisted of Tertiary conglomerate, and sundstone, TOPOGRAPHY: Quite Hilly. Outcrop was seen along roadcuts and on hillsides. Tertiony sediments were very local in extent. Their deposition was TII likely related to nearby volconic activity, rather than to any clustic sedimentary environment. The possibility of significant coal occurance is therefore low

JUNE 20/82 TARAETS 42 \$ 43 R. BERG DATES WORKED - JUNE 11 AND JUNE 12 BY L. GOLDBERG, A. PEACH RIBERG ON THE 11TH & GOLDBERG = BEREG ON THE 12 Th TPRGET OUTCROP & NUMBERS -43 ROD 38 - CONGLOMERATE 39 - SILTSTONE 40 - SANDSTONE 42 41 - CONGLOMERATE 42 - SILTSTONE SEDIMENT SAMPLES PALED 39 - SILTSTONE 40 - SANDSTONE MAP SHEET - 92I/10 DHOTOS - RLB ROLL Z FRAME 34 - SANDSTONE 0F R0034 35 - VOLC CAP ON 55 , I TRAVERSE DESCRIPTION - ACCESS FROM MERRIT TO LOGAN LAKE AND ON GRAVEL POADS TO BOTH TARKETS. TARGET 43 COULD NOT BE EXPLORED BY BACK ROADS DOE TO PRIVATE PROPERTY BUT HIWAY O/C WAS FOUND; SALL VOLC. ROCK TYPES - TARGET 43 MAPPED AS NICOLA GROUP WITH ONE SMALL AREA OF COLDWATER SEDE - THIS WAS FOUND & 15 0/C ROO38 - THE REST OF THE OUTCROP FOUND WAS VOLCANIC TARGET 42 MAPPED AS EDGENE VOLS THOUGH MT SAVONA WAS FOUND TO BE CAPPED BY A CONGLOMERATE WITH SANDSTONE INTERBEDS. DESCRIPTION OF O/C - TOPO - OUTCROP WAS SCARCE & MALL WHEN FOUND (EXCEPTION MT SAVONA)

& TOPOGRAPHY WAS GETVILE & FLAT AROUND TUNKWA LAKE . TI TARGET 4/2 COULD USE MORE INVESTIGATION PERHAPS A TRAVERSE DOWN MT SAVONA TO SEE IF ANY SEDS LIE FURTHER DOWN THE MTN, BUT DUE TO THE POOR EXPOSURE AROUND THE REST OF THE AREA LITTLE WOLLD BE GRINED BY OTHER TRAVERSES, MY SAVONA : TRAVERSE DOWNHILL ON THE 26th JUNE - VESICULAR BASALTS SEEN + 1 SST D/C. SAMPLE ROOS7

SNEAK LOOK ON COAL LEASE H.EH. S.W. OF KAMLOOPS IN 42 CREW DAY TARGET 42 No SAMPLES NO PHOTOS DATE ! JUNE 12, 82. BASED OUT OF THERRIT THE COAL LEASE ! (OWNER?) IS SITUATED ON 10p0: FRAE RANGE LAND & MOOSE PASTURE. THE AREA ENCLOSED BY COAL LEASE APPEARS TO EXHIBIT LITTLE OR NO OF ( PROBABLY THE LATER). THE PIPELINE THAT RUNS THRU PROPERTY EXPOSED BLOCKS DE BENT RK. THE BLOCKS WERE ALL A VERY BASIC INTRUSIVE, PROBABLY LABBRO, ONTHE EAST SIDE OUT OF TROPERTY WE SAN SOME RYHOLITIC BRELLIA AND VISILULAR BASALT OF WHICH I ASSUME ARE THE LOWER MOST SECTION OF THE EDGENE VOLCANIC. I FEEL THIS PROPERTY IS A BUST FOR TWOREASONS 1) I FEEL THE INTRUSIUE IS THE ONLY UNIT UDIDERLYING THIS AREA (BECAUSE OF RELIEF) 2) THIS AREA IS AT TEAST 500 TOPO LOWER THAN THE BASE? OF THE SEDIMENTARY ROCK (CONG.) OPBERVED ON MT. SAVONA. HOWEVER THERE IS A POSSIBILITY THAT SOME STRUCTURAL FEATURE HAS DROPPED THIS AREA BUT I DOUBT BECAUSE NO VOLCANIC WAS OBSERVED . THE ONLY TYPE OF COAL OCCURRANCE WHICH COULD EXIST IS A OUT LAER IN THE INTRUSIVE, BUT THE ABSENCE OF RELIEF MAKES THIS HIGHLY UNLIKELY. RECOMMENDATION. CHECH WATERHOLE LOGS IN THIS AREA. SEPS. TT + OR

TARGET 44 DATE WORKED : JUNE 13/82 - ONE CREW H.H. "D.H. WORKED OUT OF MERRIT. ACCESS MORERATE OUT OF LOGAN LA TOPOGRAPHRY FLAT & MUDDY ESSENTURNLY NO OJE HEAVILY FORESTED. ONLY ONE OR OF VOLS FOUND MOSTLY HEAVY OVER BURDEN NO - PHOTOS, SAMPLES OR OIC#

JUNE10/82 TARGET # 50 R. BERG I PATES WORKED - JUNE 10/82 OUTEROPS - ROO37 SEDIMENT SHOWS - ROOS7 - CONGLOMERATE JEDIMENT SAMPLES - NONE MAP SHEET - 921/2 PHOTOS - NONE I TRAVERSE DESCRIPTION TROAD TRAVERSE WITH ALLESS TO THE PREA FROM HWAY #5, SOUTH OF MERRIT. ROCK TYPES - VOLCANICS, GRANDDIDRITE, CONGLOMERATE DESCRIPTIONS OF O/C, TOPO - TOPOGRAPHY WAS ROLLING, MILLY LAND WITH THE VOLCANICS GENERALLY FOUND ON HILLSIDES & THE CONGLOMERATES IN ROAD CUT. I THE ONLY SEDS FOUND WERE CONGLOMERATES & SINCE O/C IS SO POOR, POSSIBILITY OF FINDING RESSISSIVE SEDS 15 FEMOTE.

TARGET 38 BASE OF OP: MERRIT B.C. DATE : JUNE 10/81 NUMBER OF CREW DAYS: 1201 HH & L. G. E. A.P. ACCESS QUITE GOOD - RANGE ROADS. No ole ON TOP OF PLATERU VOLCANIC - ROCENE BASALTS ANDESTTE FOUND PERIPHERY CUTTING UPSECTION THE No photos, of # SAMPLES TARGET 51 BASE OF OF . MERRIT B.C. DATE JUNE 10/81 NOMAGE OF CREW DAYS : 1/2 DAY AS ABOVE ACCESS : REASONIBLE Ola: APPROXIMATELY 5% / HEAVY OVERBURDEN. BOCK ENCOUNTERED WERE EDCENE RHYDLITE ANDESITE NEAR HWY, THEN TRIASSIC ME BEPIMENT AS WE DROVE IN LAND. No Prioros, Ole", SAMPLES.

TARGET AREAS 52,53,54 € 55 DATE: JUNE 26 A.P. & D.H. # CREW DAYS 1 # 0/0 ' 1 0 # SED 3 HOWS : 0 # PALEO SAMPLES! 0 - TOO REMOTE (G.S.C. MAPPED AS MIDCENE VOLCANICS # 52 # 55 - NO ACCESS - ACCESS BLOCKED & OVERGROWN # 54 # 53 - ACCESS WAS MODERATE, I ROAD CROSSED THE TARGET AREA , NO OUTGROD EXPOSURES. GEOLOGY: NO OUTCROP OF EDGENE DEDIMENTS WERE OBSERVED. BBUNDANT CONGLOMERATE FLOAT (PEBBLE CONG) Subrounded Red in color. SANDY SILT GLACIAL MATERIAL BEDDISH INCOLOR WITS EXPOSED EVERYWHERE UNLIKELY POSSIBILITY OF COAL DUE TO TYPE OF CONG AND COLOR OF SEDIMENT FLOAT (OXIDIZED) NO FURTHER WORK WHRRANTEN

TARGET 57 I DATES : JUNE 23/82 BY LA & RB, JUNE 24 BY LG, DH, SAP. OUTCROP: ROD54 - Conglomenate : 55% interbedo Rooss - typ and debis flow R0054 - 552 SAMRES 921/11 MAP : POCESS - OFF HIWAY #1 TO ASHCROFT BY TL GRAVEL ROAD. ROCK TYPES - OUTCROP SEEN ONLY IN ROAD CUTS 5 CONSISTED OF VOLCANICLASTICS 1 CONSLOMERATE TOPO - O/C - O/C SCARCE & TOPO VERY FLAT ONE SEDIMENTARY OF WAS FOUND IN TIL AREA MARAED AS VOLCANICS ONLY.

JUNE 13/82 COLDWATER BEDS JOUTH OF JPENCES BRIDGE R. BERG I DATES WORKED - JUNE 13/82 - 1 CREW DAY BY L.GOLDBERG & R. BERG. OUTCROP - ONE SED O/C ROOH3 - SANDSTONE -PALED SAMPLE TAKEN ROO 43-7 MAP SHEET - 921 6 - SPENCES BRIDGE. I TRAVERSE DESCRIPTION - BY ROAD - ACCESS FROM HWAY #1 5W. OF SPENKES BRIDGE TOPO/O/C - TOPO WAS VERY STEEP & OUTEROP WAS MOSTLY FOUND ON HILLSIDES -ROCK TYPES - MUSTLY VOLCANICS AND VOLCANOCLASTICS. 1 O/C OF WELDED TUFF. ONE O/C OF MEDIUM GRAINED SANDSTONE. THOUGH CONL WAS REPORTED IN THE AREA IN T ONE VERY SMALL LOCATION, IT WAS NOT FOUND. SURPOUNDING AREA WAS SEARCHED, HOWEVER, ANTS ONLY VOLCANIES WERE FOUND.

CHU CHUA DATE WORKED : JUNE 23 CREW DAYS : UZ DAY H.H., AP.S.D.H. NOT OF O/C : FONE HOOZZ No# OF SAMPLE: " " CONG N# OF PHOTOS: NONE. ACCESS TO THE SMALL PODS OF EDGENE SEDG WAS EXCELLENT, HOWEVER THE PRESENCE OF THE INDEAN RESERVE PROHIBITED IS FROM VEINING THE COAL SHOWING. ALL OUR EFFORTS RESULTED IN FINDING ONE OLE SHOWING ON THE RAILLINE UNDER THE TOWN (? SIG) DE CHU CHUA. WATER HOLE LOGS & OPEN FILE REPORTS MIGHT BE SOUTHE HELP IN THIS AREA.

JUNE 27/82 RED POINT R. BIRG I DATES WORKED - 1/2 DAY - JUNE 26 BY RBERES & 2. GolDBERG. DUTCROP - YOLCANICS SURROUNDING EDCENE SEDS 0/C ROOSS = ROOS9 BOTH SEDS SAMPLES - ROUSS - SILTSTONE + SST ROD 59 - " MAP - 921/15 ACCESS - TRAVERSE BY ROAD FROM TRANQUILLE CREEK RD. ROCK TYPES - VOLCANICS MOSTLY - SED O/C ARE VERY RESSESSIVE = ONLY SEEN IN ROAD CUT 0/C - TOPO - VOLCANICS EXPOSED ON HILL SIDES -TERRAINE GENTLE ROLLING HILLS. SEDS MAPPED IN AREA WHERE FOUND - NO CORL 20 TIL SEEN - SEDS SEEN IN LOW TOPO PREAS AND IT IS PROBABLE - AIAT THEY EXTEND UNDER THE OVER-LYING VOLS.

JUNE 13/82 EDGENE VOL, THREAT SOUTH DF R.BERG MERRIT DATES WORKED - THURSDAY, JUNE 10/82 BY R.BERG + D. HOWMED. OUTEROP - NO STATIONS TAKEN MAP SHEET - 92 I/2 - MERRIT I TRAVERSE - ~ZARS ON ROAD - ACCESS FROM MERRIT ROCK TYPES - ALL VOLCANIC EXCEPT PLEISTOCENE SEDS. DESCRIPTION OF OC \$ TOPO - TOPO WAS HILLY & OUTCROP OF VOLS FOUND ON HILLSIDES. I NO SEDS WERE FOUND IN OUTCROP THOUGH PROXIMITY TO MERRIT COAL FIELD SOME MAY BE FOUND - THOUGH - ON THE OTHER HAND, THE MEER PROBABLY HAS BEEN EXTENSIVELY SEARCHED FOR COAL DEPOSITS.



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GEOLOGICAL SERIES

## LEGEND



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Geology by S.Duffell and K.C.McTaggart, 1945-46, and K.C.McTaggart, 1947 Cartography by the Geological Mapping Division, 1951

20 Kathleen claim (Copper)

21 Lytton Gold prospect (Gold)

22 Clarke prospect (Antimony)

24 Glacier group (Gold, silver)

25 Paystreak group (Silver)

23. Green Gold Jade claims (Vesuvianite)

26 Serpentine and Summit groups (Gold)

7 Fairview group (Zinc)

12 Glossy group (Copper)

13 Transvaal group (Copper)

9 Coronation group (Silver, lead, zinc)

11 Martel mine (Gold, molybdenum)

8 Cornwall Creek (Chrome Pit) occurrence (Chromium)

10 Basque epsomite deposits (Magnesium sulphate)



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CANADA DEPARTMENT MINES AND TECHNICAL SURVEYS GEOLOGICAL SURVEY OF CANADA



SHEET 92 I (West Half)

## DESCRIPTIVE NOTES

West of Fraser River, the map-area occupies part of the Coast Mountains of British Columbia, and the high ridges southeast of Lytton mark the northern extremity of the Cascade Mountains. Elsewhere the area forms part of the Interior Plateau, and its vegetation and climate are largely characteristic of the 'dry belt' of this region.

The Cache Creek group (5, 6) constitutes a thick succession of mainly chert argillite, altered volcanic rocks, and crystalline limestone, much of which is deformed and largely altered to talc, chlorite, and sericite schists. The distinctive crystalline limestone of Marble Canyon and Pavilion Mountains is mapped separately as the Marble Canyon formation (6). Lenses and patches of metamorphosed rocks (7) within the Coast intrusions consist in part of chlorite, hornblende, and quartz-mica schists, and in part of granitic gneiss. Some parts of the large area of these rocks on Scarped Mountains are identifiable as Cache Creek (5), but other lenses may include strata of Mesozoic

Unfossiliferous, metamorphosed rock groups of uncertain identity (8-10), west of Fraser River, probably comprise strata of both Palæozoic and Mesozoic age. One group of mainly micaceous and graphitic phyllite (8) is probably of late Palæo-zoic age, but may include younger formations. Another varied assemblage of sedimentary and volcanic rocks (9), at least 7,500 and probably 10,000 feet thick, is probably in part Cache Creek. Still another group, comprising many thousands of feet of grey to black phyllite, grey argillite, conglomerate, and greywacke (10), extends southeast into Hope map-area, where it appears to include rocks of the Upper Jurassic (?) or Lower Cretaceous Ladner group. It also affords points of resemblance with the Lower Cretaceous Brew group (13).

Nicola group rocks (11) consist mainly of medium-grained, basaltic and andesitic lavas, largely altered to greenstones, greenish grey tuff, and agglomerate. Argillite, chert, greywacke, and limestone, associated with volcanic rocks near Basque, have yielded marine fossils of Upper Triassic age. The group has been meta-morphosed by the Guichon Creek batholith (1) and occurs as small roof pendants within, or as relatively small bodies along, the border of the batholith. Conglomerates, shales, and sandstones of Jurassic age (12) occupy a narrow

synclinal belt near Ashcroft. The sandstones, commonly arkosic, and the conglomerates are greenish grey. The black shales, commonly carbonaceous, have vielded ammonites of Middle and Upper Jurassic age. East of Basque, conglomerate at the base of the succession rests unconformably on granitic rocks (1). The Brew group (13) consists mainly of banded argillite, impure quartzite, and boulder conglomerate, and contains marine fossils of early Lower Cretaceous age. The Lillooet group (14) and the Jackass Mountain group (15-17) form a belt of folded and deformed Lower Cretaceous sedimentary rocks along Fraser River,

and are in faulted contact with all adjacent rock groups. The Spences Bridge group (18), consisting of about 5,000 feet of varicoloured volcanic rocks, mainly lavas, and minor continental sediments, has yielded fossil plant remains of mid-Lower Cretaceous age. The lavas are generally much de-composed, and are commonly traversed by thin stringers of pink and white calcite. The group is gently folded, much of it lying horizontally or nearly so. Sedimentary rocks (19) and volcanic rocks (20) of the Kingsvale group unconformably overlie the Spences Bridge group along Nicola River. The light-coloured sedimentary strata at the base of the group reach a thickness of 800 to 1,000 feet

on Shakan Creek, but may be missing elsewhere. Fossil plant remains collected from them are of late Lower Cretaceous age. Small areas of sedimentary rocks on Botanie Creek and Fraser River near Stein River were mapped with the Kingsvale group on the basis of fossil evidence. The volcanic rocks, which constitute the bulk of the group, are largely of andesitic and basaltic composition and flows are commonly amygdaloidal Evidence obtained in Nicola map-area to the east suggests that certain local accumulations of conglomerate and sandstone (21) may be either of Cretaceous

or Tertiary age. The conglomerate contains boulders and pebbles of Cache Creek and Nicola group rocks as well as of granite. A succession of sedimentary and volcanic rocks (22) 4,500 feet thick has yielded fossil leaves of Eocene age. Coarse conglomerates in the exposed sections contain easily recognized boulders of Lower Cretaceous rocks (13-17). These Eocene strata form one of the many fault blocks along Fraser River, and the steep dips and close folds are mainly the result of fault movements. Most of the Kamloops group consists of volcanic rocks (24), but with them are

included several small areas of Tertiary sedimentary beds (23), which at upper Hat Creek and south of Spences Bridge are coal bearing. The sedimentary strata are probably the equivalent of the Coldwater beds of the adjoining Nicola maparea. The volcanic rocks exhibit a wide range of colours; they are mainly dark, dense, fine-grained basalts, but include thick beds of agglomerate, minor breccia, and tuff. Thin beds of argillaceous material yielded poorly preserved leaves of Tertiary age.

All of the map-area was covered by ice during Pleistocene time except perhaps some of the higher peaks of the Coast Mountains. Pleistocene and Recent drift mantles most of the plateau region. White silt deposits are prominent along Thompson River east of Spences Bridge. Alluvial fans, and ice-contact and glacial outwash deposits are common, and the major valleys are lined with marginal terraces of sand, gravel, and clay.

Batholithic rocks of the Coast intrusions consist mainly of granite, granodiorite, guartz-diorite, and diorite. The Guichon Creek batholith (1) intrudes Upper Triassic rocks (11) and is overlain by Middle and Upper Jurassic rocks (12). The Mount Lytton batholith (2) is overlain by lavas of the Spences Bridge and Kingsvale groups (18-20) and may be of early Lower Cretaceous age, but is probably more nearly contemporaneous with the Guichon Creek mass. The widespread granodiorite (3) of the Coast Mountains is believed to be of mid-Lower Cretaceous age. Elongate bodies of ultrabasic rocks (B), with which are associated bodies of hornblende diorite and related rocks (A), are exposed in the Coast Mountains. The rocks of the main serpentine belt in the southwest corner of the map-area are, apparently, about in line with those of the serpentine belt to the southeast in Hope map-area, and are probably of Cretaceous age. Small undifferentiated bodies of serpentine associated with Cache Creek rocks along Bonaparte River carry significant chromite deposits. Several minor intrusions (4) cut rocks of the Fraser River Lower Cretaceous belt

(14-17). The belt of Lower Cretaceous rocks along Fraser River may be regarded as a series of fault blocks or slices involved in a major zone of faulting along which rocks to the west have been relatively elevated. From the south border of the map-area to Cinquefoil Creek the Cretaceous rocks appear to occupy a graben. Farther north, rocks to the west of the Cretaceous belt appear to be elevated, and those to the east relatively depressed, with respect to the Lower Cretaceous rocks. Albitization and, to a lesser extent, prehnitization are features of many of the rocks in and adjacent to the Fraser River Cretaceous belt. The abundant albite of some of the intrusive rocks is a product of metasomatism, a process that is believed also to have affected the older bedded rocks (14) of the Cretaceous belt; the albite of the younger formations is probably of detrital origin.

The map-area contains a variety of metallic and industrial origin. several of which have been productive. Placer gold has been mined on all major streams, but only in small amount since early years of the present century. Stib-nite is found in irregular quartz veinlets along a fault zone in granodiorite near the headwaters of Stein River. Plutonic rocks of the Guichon Creek batholith are host to copper deposits near Highland Valley, and contain hematite deposits in shear zones near Toketic. The copper minerals occur in veins and shattered zones associated with tourmaline and hematite, and the wall-rocks are commonly highly sericitized. The greatest production came from the O.K. mine, which during the period of its activity mined and concentrated 10,000 tons of ore containing 3.6 per cent copper. The Maggie mine on Bonaparte River was prospected underground as a copper deposit. Fifty tons of selected ore yielded 2 ounces of silver a ton, 8 per cent copper, and low assays in lead and zinc. Chromite occurs in ultrabasic rocks along Bonaparte River, the principal discoveries having been made on Scottie Creek and the creek south of it. Gold and silver have been reported from quartz veins in the schist, argillites, and batholithic rocks in the southwest corner of the map-area. The Big Slide (Grange) mine has produced gold, copper, and silver from narrow quartz veins in diorite. Considerable exploration work has been done at the Martel property on narrow lenticular quartz veins in Cache Creek rocks that contain molybdenum and gold. Narrow quartz veins carrying sphalerite, galena, and chalcopyrite occur in Triassic rocks east of

Coal has been mined with limited success from the deposit at upper Hat Creek. Occurrences of gypsum, jade, vesuvianite, magnesium sulphate, and sodium carbonate have been recorded, and some magnesium sulphate has been produced from the deposit at Basque. Much of the Marble Canyon formation is composed of very pure limestone.

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KAMLOOPS, LILLOOET AND YALE DISTRICTS BRITISH COLUMBIA

Scale: One Inch to Four Miles =  $\frac{1}{253440}$ Approximate magnetic declination, 24'15'East

Copies of this map may be obtained from the Director, Geological Survey of Canada, Ottawa



Joins Map 737A, "Hope"

MAP 1010A

ASHCROFT

Contours (interval 500 feet) Contours (position approximate) Height in feet above mean sea-level

Main highway with rou e number

Post Office

Land District boundary

Forest Reserve boundary

Indian Reserve boundary

Intermittent stream

Trail Church

Glacier

Base-map compiled by the Bureau of Geology and Topography from surveys and from information supplied by the Department of Lands and Forests, British C lumbia.

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DATE GEOLOGIST OUTCROP SLIDE/PHOTO JUNE 8 REACH ROO32 - MAP ROO32 - MAP ROO32 - MAP ROO32 - MAP ROO32 - MAP ROO32 - LATITUDER SAMPLE(S) - GEOLOGY ELEVATION GEOLOGY GEOLOGY UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEATURE 1 00/ 12/2 29/2 4/ - 10/02 10/ 10/ - 20/ 25/ 25/ 20/ 20/ 20/ 20/ 20/ 20/ 20/ 20/ 20/ 20	7685 \$2/05	OUTO	CROP	DESC	CRIPTIC	ON F	OR	M		
JUNES     R.BORG     ROO32       MAP     AERIAL PHOTO     SAMPLE(S)       921/2     -     -       LONGHTUDE E     LATITUDEN     ELEVATION       669350     5543650     3700'       GEOLOGY       UNIT     LITH.       COLOR     THICK     COMP.       GRAIN R 5 POS PEATURE       UNIT       LITH.     COLOR       THICK COMP.       GRAIN R 5 POS PEATURE       COMMENTS:       VOLCANTICUASTIC       UNIT       LITH.       COLOR       THICK COMP.       GRAIN R 5 POS PEATURE       UNIT       LITH.       COLOR       THICK COMP.       GRAIN R 5 POS PEATURE       COMMENTS:       UNIT       LITH.       COLOR       THICK COMP.       ORAL INTERVAL       DESCRIPTION       COLOR       THICK COMP.       ORAL INTERVAL       DESCRIPTION       STRUCTURAL	DATE	GEO	LOGIS	ST.	OUT	CROP			SL	IDE /PHOTO
MAP     AERIAL PHOTO     SAMPLE(S)       921/2	JUNE8	R	Ber	2Gy	K	003	2	-		1
LATITUDEA 664350     ELEVATION 3500       GEOLOGY       UNIT     LITH. COLOR 100 P     GRAIN R S FOS FEATURE STORENTS:       UNIT     LITH. COLOR 100 P     GRAIN R S FOS FEATURE STORENTS:       UNIT     LITH. COLOR 200 COAL 100 P     COAL 100 P       UNIT     LITH. COLOR 200 COAL 100 P     COAL 100 P       COAL 100 P     COAL 100 P       COAL 100 P     COAL 100 P       COMMENTS:       STRUCTURAL BEDDING NO. TAKEN GEOLOGY     TYPE ORIENT DISF TYPE ORIENT PLUNGE       OUTCROP SKETCH       OUTCROP SKETCH	921/2	AEP	RIAL I	рното	SAM	PLE(S)	-			
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	UNIT 3 COMMENTS: STRUCTURA GEOLOGY TYPE ORIE	AL		THICK	COMP.	GRAIN SIZE	TYP TYP	S IN PE	FAU	SED. FEATURI
	UNIT 3 COMMENTS: STRUCTURA GEOLOGY TYPE ORIE		BEDD RAN	THICK	COMP.	GRAIN SIZE	TYP	S IN PE	FAU ORIT	SED, FEATURI
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DATE GEOLOGIST OUTCROP BLDEA JUNES RBARG ROO33 MAP AERIAL PHOTO SAMPLE(S) 9212 LONOTTUDE E EATITUDE A STA GEOLOGY UNIT LITH. COLOR THICK COMP. GRAIN R S POS PEA 1 EARD SRY SPALIM 11HA 9-D2TP - MA COMMENTS: APPEARS SEDIMENTRRY UNIT LITH. COLOR THICK COMP. GRAIN R S POS PEA APPEARS SEDIMENTRRY UNIT LITH. COLOR THICK COMP. GRAIN R S POS PEA COMMENTS: STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT TYPE OBLOS JOINTS INTRUSIVE TYPE OBLOS JOINTS INTRUSIVE TYPE OBLOS AND SKETCH COAL DET		s (	JUT	CROP	DESC	RIPII	JN FI	URI	WI	Inte	DE /PHOTO
JAJE O     ICBERRY     ROO33       MAP     AERIAL PHOTO     EAMPLE(S)       9212     -     -       LOMOTUDE E     554/600     375       GEOLOGY     Image: State and State	DATE	19	GE	2D	TO G	001	CHOP	_		1	Deprilore
MAP 9212 LOMOTTUDE E GEOLOGY UNIT LITH. COLOR THICK COMP. GRAIN R S POS FEA COMMENTS: OF COLOR THICK COMP. GRAIN R S POS FEA APPERS SEDIMENTARY UNIT LITH. COLOR THICK COMP. GRAIN R S POS FEA APPERS SEDIMENTARY UNIT LITH. COLOR THICK COMP. GRAIN R S POS FEA COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S POS FEA COMMENTS: STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT GEOLOGY INTERVAL ORIGINAL SECONDENTS: STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT TYPE FOLDS JOINTS INTERVAL OF ORIENT OUTCROP SKETCH COAL DET	Jon	eo	10	CBC	1-9	KO	03.	3	_		1.5
9212     Image: Statistic state     Image: State     Image: Statistic state     Image: Statistic state     Image: Stat	MAP		AE	RIAL I	рното	SAM	PLE(S)				
CONSTTUCE       EATTITUDE       N       ELEVAT         GETTODE       SSH/GOO       375         GEOLOGY         UNIT       LITH.       COLOR       THICK       COMP.       GRAIN       R       S FOS       FEA         COMMENTS: 090 PROVE - CONG/OWNALE S         APPERES SEDIMENTRAY         UNIT       LITH.       W OF       COAL       INTERVAL       DESCRIPT         COMMENTS:         UNIT       LITH.       W OF       COAL       INTERVAL       DESCRIPT         COMMENTS:         UNIT       LITH.       W OF       COAL       INTERVAL       DESCRIPT         COMMENTS:         STRUCTURAL       BEDDING NO.       TAKEN       TYPE ORIENT         GOLOGY         TYPE ORIENT         OUTCROP SKETCH         OUTCROP SKETCH	92	212	-	1		1	1001		_		
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GEOLOGY       UNIT     LITH.     GRAIN     GRAIN       INTENTAL       COMMENTS:       UNIT     LITH.     GOLOGY       UNIT     LITH.     GOLOGE       UNIT     LITH.     COMMENTS:       UNIT     LITH.     COMMENTS:       UNIT     LITH.     COMMENTS:         UNIT     LITH.     COMMENTS:         UNIT     LITH.     COMMENTS:         UNIT     LITH.     COLOGY       THICK COMP.     GRAIN # \$ PCS PS       COMMENTS:         STRUCTURAL     BEDDING NO. TAKEN     TYPE FOLDS       TYPE OBLOGY     INTRUSIVE       TYPE OBLENT PLUNGE     JOINTS     TYPE RELA       OUTCROP SKETCH       COAL DET	66	490	0		554	160	0	_	_	3	UCI
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UNIT UNIT UITH. W P OR I MITH JORT - CONSTRUCTION OF COAL INTERVAL DESCRIPT 2 APPEARS SEDIMENTARY UNIT LITH. W COLOR THICK COMP. GRAIN & SPOS SEDIMENTERVAL COAL ZONE COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN & SPOS SEDIMENTS: UNIT LITH. W P THICK COMP. GRAIN & SPOS SEDIMENTS: COMMENTS: STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT GEOLOGY MEAN TYPE ORIENT GEOLOGY JOINTS INTRUSIVE TYPE ORIENT PLUNGE JOINTS INTRUSIVE OUTCROP SKETCH COAL DET		LITH.	co	LOR	THICK	COMP.	GRAIN	R	5	Fos	SED.
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FOLDS         JOINTS         INTRUSIVE           TYPE         DRIENT         PLUNGE         TYPE         RELA           OUTCROP         SKETCH         COAL         COAL         DET	GEO	LOGY									
OUTCROP SKETCH COAL DET		FOLD	PLI	UNGE	-	JOINTS		т	YPE	H	ELATION
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ZONE	NAME OF		-		_		-	-	-	
UNIT 3 COMME	LITH.	ço	LOP	тніся	K COMI	GR/ SIZ	IN R	s	Fos	SED.
UNIT 3 COMME	LITH.	ço	BEDD	THICH	K COM	GR/ SIZ	IN R	8	FAU	SED. FEATURE
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	LITH.	COLOR	THICK	COMP.	GRAIN	RS	Fos	SED.
42	Val	SYR IOYR	1 m				1	
COMM	ENTS:	2141612	1.4					
inte	med use	f.gr v	oleanic.	s [J.a.	otic)	- 62/3	SUC P	henocrys;
UNIT	LITH.	COL	OR	THI	CK	aL 1	DESC	RIPTION
COAL	-							
ZONE	ENTS	t	-		_	-		
- PO	sibly (	volcanie	debri to gite	s Plan	shally	osts Istu	101 PA	8-11
STRU	CTURAL	BEDD	ING NO	. TAKEI	AN	TYPE	FAU	LTS
GEO	DLOGY							
TYPE	FOLD	PLUNGE	-	JOINTS		TYP	E R	ELATION
						_		110-150 cm
	01	UTCROP S	SKETCH			co	AL	DETAIL
								15
								165

7685 sz/o		ουτα	RE	DESC	AISSA	NCE ON F	OR	м		
DATE		GEO	LOGIS	T	our	CROP	-		SLI	DE/PHOTO
June	2	R.	Bei	8-	R	000	5			/
MAP		AEF	IAL P	ното	SAN	IPLE (S	)		-	
92	H/7			/			/	·		
LONGIT	UDE EA	st-	- 1	LATITU	DE NO	RTH		-	ELE	VATION
6	7660	1		54	629	0		_	10	40 m
				GEO	LOGY	12 C				
	LITH.	COI	OR	THICK	COMP	GRAIN	R	5	FOS	SED.
I	Val	EYR2	NS	1.50	605.	f.gr				
COMME	NTS:	1		T Paul P. 1	-	1	-	-		
-fu	e ar.	busa	14 -	plag 1th	enper yst	5 A /	10			
UNIT	LITH	.	COL	DR	COAL	ICK	AL	0	ESCI	RIPTION
COAL				-	COME		_			
COMME	NTS		-	-			-	-		
	LITH.	ço	LOP	THICK	COMP	GRAI	R	s	FOS	SED.
COMME	ENTS				-	-	-		1	
-			BEDD	ING NO	. TAKE	N	1		FAU	LTS
GEO	LOGY	-	RAN	GE	M	EAN	TY	PE	ONIE	INT DISP.
	FOLD	5		-	JOINTS		-	IN	TRU	SIVES
TYPE	ORIENT	PLU	NGE				1			
_	0	UTCF	OP S	KETCH	4		1	co	AL C	DETAIL
	-									
							1			
							1			
							L.			
1										
										(*)

DATE JUNE 2nd R. BERGE ROODS AND LEGAL ALL PHOTO SAMPLE(S) NAP AERIAL PHOTO SAMPLE(S) 12 H/7 ELEVATION 6 7670 34 6220 1035 M GEOLOGY UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FED. 1 Vol C STR. 10444 1.5 m Apr COMMENTS: And Size R S FOS FED. THICK COMP. GRAIN R S FOS FED. COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FED. COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FED. COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FED. COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FED. COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FED. COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FED. COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FED. TYPE ORIENT SIZE R S FOS FED. TYPE ORIENT FLUNGE JOINTS TYPE ORIENT DIS TYPE ORIENT FLUNGE JOINTS TYPE RELATION OUTCROP SKETCH COAL DETAIL	7685 82/0	s (		RUP	DESC	HIPI	IL	IN POP	UN	IVI .	ISL	DE/PHOT
MAP     ALENIAL PHOTO     SAMPLE(S)       TALENIAL PHOTO       TALENIAL PHOTO       SAMPLE(S)       COMMENTER B       LATUITUDE IN       ELEVATION       GEOLOGY       UNIT     LITH.     COLOR THICK COMP. GRAIN R 5 FOS FEATUR       UNIT       LITH.     COLOR THICK COMP. GRAIN R 5 FOS FEATUR       UNIT       LITH.     COLOR THICK       UNIT       LITH.     COLOR THICK       UNIT       LITH.       COLOR THICK COMP. GRAIN R 5 FOS FEATUR       COMMENTS:       UNIT       LITH.     COLOR THICK       UNIT       LITH.       COLOR THICK COMP. GRAIN R 5 FOS FEATUR       COMMENTS:       UNIT       LITH.       COLOR THICK COMP. GRAIN R 5 FOS FEATUR       COMMENTS:       STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT DIS       GEOLOGY       STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT DIS	DATE	ban	D	Re		R	0	00	6			/
MAP     AERIAL PHOTO     MARTINE PHOTO       12, H/7     Interval     ELEVATION       LONGATODE     E     LATUTUME     IN       67670     546280     1035 m       GEOLOGY       UNIT     LITH. COLOR       Thick comp.     GRAIN R S FOS FEATUR       1     Vol c     546280     1035 m       UNIT       1     Vol c     546280       COMMENTS:     Age     1       COMMENTS:     Age     1       UNIT     LITH.     COLOR     THICK       COMMENTS:     COLOR     THICK     DESCRIPTION       COMMENTS:     COMMENTS:     EDDING NO. TAKEN     FOS FEATUR       COMMENTS:     STRUCTURAL     BEDDING NO. TAKEN     TYPE ORIENT DIS       STRUCTURAL     BEDDING NO. TAKEN     TYPE ORIENT DIS       TYPE     OHIENT     JOINTS     TYPE RELATION       OUTCROP SKETCH     COAL DETAIL	June	1	K	DEI	8-	1		PLE(s)	0	-	1	-
LONGHTUDE E LATITUDE IN 67670 346280 1035 M GEOLOGY UNIT LITH. COLOR THICK COMP. GRAIN R 5 FOS FED. FOR SIZE R 5 FOS FEATUR 1035 M COMMENTS: -Andesic F.g.r - held + play phenocrysts UNIT LITH. COLOR THICK COAL INTERVAL DESCRIPTION COAL 2004 COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R 5 FOS SED. COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R 5 FOS SED. COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R 5 FOS SED. COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R 5 FOS SED. COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R 5 FOS SED. COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R 5 FOS SED. COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R 5 FOS SED. COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R 5 FOS SED. TYPE ORIENT PLUNGE JOINTS TYPE ORIENT DIS TYPE ORIENT PLUNGE JOINTS TYPE RELATION COAL DETAIL	92 H	17	ALP	/	PHOTO	1			1			
57670     546280     10.35 m       GEOLOGY       UNIT     LITH.     COMP. GRAIN R 5 FOS FEATUR       1 Vol c 53 % 10/00 1/15 m     Age of thick comp. GRAIN R 5 FOS FEATUR       UNIT       LITH.     COLOR THICK COMP. GRAIN R 5 FOS FEATUR       UNIT       LITH.     COLOR THICK COMP. GRAIN R 5 FOS FEATUR       COMMENTS:       UNIT       LITH.     COLOR THICK COMP. GRAIN R 5 FOS FEATUR       COMMENTS:       UNIT     LITH.     COLOR THICK COMP. GRAIN R 5 FOS FEATUR       COMMENTS:       STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT DIS       STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT DIS       TYPE FOLDS       JOINTS       INTRUSIVES       TYPE ORIENT PLUNGE       JOINTS       INTRUSIVES       TYPE ORIENT PLUNGE       JOINTS       INTRUSIVES       COAL DETAIL	LONGIT	DE E		1	LATITU	OE L	N		-		ELE	VATION
GEOLOGY       UNIT     LITH.     COMMENTS:       COMMENTS:       And/Si/C     F. Held + play phenocrysts       UNIT       LITH.     COLOR       THICK COMP.     GRAIN R     S FOS FEATUR       COMMENTS:       UNIT     LITH.     COLOR     THICK COMP.     GRAIN R     S FOS FEATUR       COMMENTS:       STRUCTURAL     BEDDING NO. TAKEN     TYPE ORIENT DIS       TYPE ORIENT PLUNGE     JOINTS     TYPE RELATION       OUTCROP SKETCH     COAL DETAIL	676	570			546	280					10	55 m
UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED. 1 Vol C SYR 10/44 1.5 m 4 pr 1 COMMENTS: -Anderic F.g.r - hb(d + play phenocrysts UNIT LITH. COLOR THICK DESCRIPTION COAL 20NE UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED. COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED. COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED. COMMENTS: UNIT LITH. GOLOR THICK COMP. GRAIN R S FOS SED. COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED. COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED. COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED. COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED. UNIT LITH. COLOR THIC					GEO	LOG	Y					
UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED. COMMENTS: -And(S)C P.g.r - held + plag phenocrysts UNIT LITH. COLOR THICK COAL INTERVAL DESCRIPTION 2 CONE COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED. COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED. COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED. STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT DIS GEOLOGY HEAD TYPE ORIENT DIS TYPE ORIENT PLUNGE JOINTS TYPE RELATION OUTCROP SKETCH COAL DETAIL		LITH.	COI	LOR	THICK	сом	p.,	GRAIN	R	5	FOS	SED.
COMMENTS: -Anderic P.g.r - held + play phenocryst UNIT LITH. W F COAL INTERVAL DESCRIPTION COAL ZONE COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED. COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED. COMMENTS: STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT DIS GEOLOGY FOLDS JOINTS TYPE ORIENT DIS TYPE ORIENT PLUNGE JOINTS TYPE RELATION OUTCROP SKETCH COAL DETAIL	UNIT 1	Vala	SYR.	10484	61.5m			for				
UNIT LITH. COLOR THICK DESCRIPTION COAL ZONE COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN 3 DEDUCTOR THICK COMP. SIZE R S FOS SED. SIZE R S FOS FEATUR COMMENTS: STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT DIS GEOLOGY FAULTS TYPE ORIENT FLUNGE JOINTS TYPE ORIENT DIS TYPE ORIENT FLUNGE JOINTS TYPE RELATION	-Andes	NTS: P/C P	8.r	- hb	(a + b)	log 1	h	enscry	<i>145</i>			
COAL ZONE ZONE COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED. SIZE R S FOS FEATUR COMMENTS: STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT DIS STRUCTURAL RANGE MEAN TYPE ORIENT DIS GEOLOGY JOINTS INTRUSIVES TYPE ORIENT PLUNGE JOINTS TYPE RELATION OUTCROP SKETCH COAL DETAIL	UNIT	LITH	. [	COL	OR	COAL	HI	CK	AL	D	ESC	RIPTION
COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED. 3 BEDDING NO. TAKEN SIZE STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT DIS STRUCTURAL RANGE MEAN TYPE ORIENT DIS GEOLOGY JOINTS INTRUSIVES TYPE ORIENT PLUNGE JOINTS TYPE RELATION OUTCROP SKETCH COAL DETAIL	COAL			-			T					
STRUCTURAL RANGE MEAN TYPE ORIENT DIS GEOLOGY JOINTS INTRUSIVES TYPE ORIENT PLUNGE JOINTS TYPE RELATION OUTCROP SKETCH COAL DETAIL	UNIT 3	LITH.	ço	Lop	THICK	COM	1P.	GRAIN	R	s	FOS	SED. FEATUR
GEOLOGY INTRUSIVES	UNIT 3 COMME	LITH.	ço	LOB	THICK	COM	(P.	GRAIN	R	s	FOS	SED. FEATUR
FOLDS TYPE         JOINTS         INTROSIVES           OUTCROP SKETCH         COAL DETAIL		LITH.	ço	BEDD	THICK	COM	(E)	GRAIN	TY	S	FAU	SED. FEATUR
OUTCROP SKETCH COAL DETAIL	UNIT 3 COMME STRUC GEO	LITH.	ço	BEDD	THICK	COM		GRAIN	TY	S PE	FAU	SED. FEATUR
	UNIT 3 COMME STRUC GEO TYPE	LITH. INTS: TURAL LOGY FOLD ORIENT	CO W	BEDD	THICK	CON CON CON	IP, ME	GRAIN SIZE	TY	PE IN Y PE	FAU ORII TRUI	SED. FEATUR
	UNIT 3 COMME STRUC GEOI TYPE	LITH. INTS: TURAL LOGY FOLD ORIENT	S PLU				IP, ME	GRAIN SIZE	TYI	PE IN YPE	FAU ORII TRU AL I	SED. FEATUR INT DIS SIVES ELATION
	UNIT 3 COMME STRUC GEO	LITH. INTS: TURAL LOGY FOLD ORIENT	S FLU	BEDD RAN		AAT .C	IP.	GRAIN	TY!	IN YPE	FAU ORII TRU	SED. FEATUR
	UNIT 3 COMME STRUC GEOI TYPE	LITH. INTS: TURAL LOGY FOLD ORIENT	S FLU	BEDD RAN	THICK		IP.		TY	S IN YPE	Fos	SED. FEATUR
	UNIT 3 COMME STRUC GEOI TYPE	LITH. INTS: TURAL LOGY FOLD ORIENT	S FLU				EI ME		TYI		FAU ORII	SED. FEATUR
	UNIT 3 COMME STRUC GEOI TYPE	LITH. INTS: TURAL LOGY FOLD ORIENT	S FLU	BEDD RAN		COM	IP.		TYI	PE IN YPE		SED. FEATUR

	7685 82/0	. C	RE	CONN/	RIPTIC	NCE ON FO	OR	м		
	DATE		GEOLOGI	ST.	OUT	CROP			SLI	DE/PHOTO
	Jun	e2	R. Be	19	RO	200	7			/
	MAP	HA	AERIAL	РНото	SAM	PLE(S)	1	/		
C	12	1211		1 5 71744	TE OV	_	_	-	ELE	VATION
	67	710	_	54	6310				10	00m
				GEOI	OGY					
-		LITH.	COLOR	THICK	COMP.	GRAIN	R	s	FOS	SED.
0	UNIT	Del	10YR 565%	2 6 m		2				- ARTONO
	COMME	NTS: 6	treenston	ne - al cal to c	ght the	/bot	le	-	hern	Gile ?
	UNIT	LITH.	COL	OR	THI	CK	AL	D	ESCI	RIPTION
0	COAL		- "							
0	COMME	NTS:								
	UNIT	LITH.	COLOP	THICK	COMP.	GRAIN	R	5	FOS	SED.
	3									
	STRUC	ENTS:	BEDD	ING NO		AN	TY	PE	FAU	TS DISP.
	GEO	LOGY		101						
	TYPE	FOLDS	PLUNGE	-	JOINTS		T	IN	RI	ELATION
0		01	UTCROP S	KETCH				:0/	AL C	DETAIL
0										

		Jaro	1.001	ST	OUT	CROP			SL	DE PHOT
T	and	P	D.	2.00	R	000	8			-
244	e d	1	101	-g-	SAM	PIES	-		-	
MAP		AER	TAL	PHOTO	2010		h			
ONGH	TODE E	-	-	LATITO	DE N		-		ELE	VATION
6	7720		_	5	463.	20			. 9	13 m
				GEO	LOGY					
UNIT	LITH.	COL	OR	THICK	COMP.	GRAIN	R	s	FOS	SED.
1	hoft	JOYASH	N3	2m						
UNIT	POST LITH	ing the	COL	to int	THI	CK	AL	, D	ESC	RIPTION
COAL	-	-					-		-	
20mm		_								
	2 dow	instre	n in	-* f {	r ma	fic	int	rus	(Ve	
ما تحم										
STRU	CTURAL		BEDD		TAKE	N	TY	PE	FAU	LTS DIS
STRU GEO	CTURAL	-	RA	NGE	D. TAKE	N EAN	τY	PE	ORI	LTS DIS
STRU GEC		S PLU	RA		JOINTS	N EAN	тY		FAU ORI	LTS ENT DIS
STRU GEC		PLU	RA		JOINTS	N EAN	TY		FAU ORI TRU TRU	LTS ENT DIS
STRU GEC		S PLU	RA RA NGE	SKETC		N EAN	<u>т</u> ү т	IN YPE	TRU AL	LTS ENT DIS SIVES ELATION DETAIL
STRU GEC		UTCR	NGE			N EAN	т <b>ү</b>		TRU AL	LTS ENT DIS SIVES ELATION
		PLU	RA RA NGE		D. TAKE MI	NEAN	<u>TY</u>		TRU AL	LTS ENT DIS SIVES ELATION
		UTCR	RA RA NGE	SKETC	D. TAKE MI JOINTS	N EAN	<u>TY</u>	IN YPE	AL	LTS ENT DIS SIVES ELATION
		UTCR	RA NGE	SKETC		N EAN	<u>TV</u>	IN YPE	TRU CRI AL	LTS ENT DIS SIVES ELATION DETAIL
		PLU	RA NGE	SKETC		N EAN	<u>TV</u>	IN YPE		LTS ENT DIS SIVES ELATION
		S PLU	RA	SKETC		N EAN	TY T	IN YPE	FAU ORI TRU C R	LTS ENT DIS SIVES ELATION DETAIL
		UTCR	RA	SKETC		N EAN	<u>TY</u>			LTS ENT DIS SIVES ELATION
		UTCR	RA RA NGE	SKETC		N EAN	<u>TY</u>	IN YPE		LTS ENT DIS SIVES ELATION DETAIL

7685 82/0	. C	UTU	CROP	DESC	RIPTIC	ON F	OR	M		
DATE	-	GEO	LOGIS	IT	OUT	CROP			SL	DE/PHOT
June	2	R	Be	ra	RC	000	7			_
MAP 92	4/7	AE	RIAL I	рното	SAM	PLE(S	)			
LONGIT	UDE t		- 1	LATITU	DE N		-		ELE	VATION
	677	60		in an	5463	350			310	0-3000
				GEOI	LOGY	9				
	LITH.	co	LOR	THICK	COMP.	GRAIN	R	5	FOS	SED.
I	int	w	-	1	1		1			
COMME	NTS: G	0 6 6 P	as, s chyr	yonite. Bocylla	S Pag.	ratin L.R.N	es, Peu	- 41	in in	e sekist
UNIT 2 COAL	LITH.		COL	OR	COAL	CK	AL	D	ESC	RIPTION
ZONE				_			-			
COMME	ENTS:	-		-				-	-	
		_	BEDD	ING NO	TAKE	N		-	FAU	LTS
STRUC	TURAL	_	RAP	GE	ME	AN	TY	PE	ORI	ENT DISP
TYPE	FOLD	PLA	INGE	-	JOINTS	-	т	IN Y PE	TRU	SIVES ELATION
			_				-			
	0	UTCI	ROP	KETCH	-		-	col	ALI	DETAIL
1.11							1			
							1			

7685 82/0	. 0	UTCR	OP	DESC	RIPTI	NCE ON F	OR	М		
Tuo	.2	R. B	or and	9	RO	OLO			SLI	
MAP	4/7	AERIA	1	ното	SAM	PLE(S	/			
LONGIT		5		LATITO	DE N				ELE	VATION
61	7730		_	54	6220	)	_	_	14	$\varphi$
				GEOI	LOGY	CRAIN	a l		Contraction of the	SED.
UNIT	LITH.	W	F	THICK	COMP.	SIZE	R	5	FOS	FEATURE
1	Vol	5/6 7	11	KIm.		F.				
-onde	NTS:	acitic	1	lage i	h bld P	henrich	yst	S		
UNIT	LITH.	C	OL	DR	COAL	CK	AL	D	ESC	RIPTION
COAL									_	
						†				
COMME	ENTS: Further	up.	f	80 E	, asa 17	÷				
STRUC	TURAL	61 <sup>0</sup>	f DD RAN	ar 1	. таке М	NEAN	TY	PE	FAU	LTS ENT DISP
STRUC GEO	TURAL FOLDS	PLUNG	f RAN RE	ar l	JOINTS	N EAN	TY	PE IN YPE	FAU ORIE TRU	LTS ENT DISI SIVES ELATION
STRUC GEO	ENTS: further CTURAL LOGY FOLDS ORIENT OU SCHOY	PLUNG		A LING NO	JOINTS	N EAN MENS	TY	IN Y PI	TRU CRIE R	LTS ENT DISP SIVES ELATION
STRUC GEO TYPE	TURAL LOGY FOLDS ORIENT	up BE PLUNG PLUNG (Mn 2 ry 2	T RAN	A LING NO	JOINTS	N EAN MENIS	TY	IN YPI	TRU TRU	LTS ENT DISI SIVES ELATION
STRUC GEO TYPE - gos -shea	TURAL LOGY FOLDS ORIENT	up BE PLUNG UTCRO / Mn 2 ry 2 5 elvor		A LING NO	Joints	N MENIS I/C	TY	IN YPE	AL I	LTS ENT DISI
STRUC GEO TYPE - gos - shea - post	ENTS: further CTURAL LOGY FOLDS ORIENT OI SCONY	Inf PLUNO PLUNO Inf Inf Inf Inf Inf Inf Inf Inf	f CDD RAN	A L	JOINTS	N EAN MENNIS I/C	TY T	IN YPE	TRU TRU	LTS ENT DISI
STRUC GEO - GOS - Shea - Post	TURAL LOGY FOLDS ORIENT	up peuno peuno urcao / Mn 2 ry 2 s elvago	f RAN	A L	JOINTS	N EAN MENIS HC	TY		FAU ORII	LTS ENT DISI SIVES ELATION DETAIL
STRUC GEO TYPE - 405 - Shea - Poss	ENTS: further CTURAL LOGY FOLDS ORIENT OI SCHOY	UTCRO / Mn 2 ry 2 s elvago	f RAN Etc	A L	JOINTS	N EAN MENIS HEC	TY		FAU ORII	LTS ENT DISP SIVES ELATION DETAIL
STRUC GEO TYPE - GOS - Shea	TURAL LOGY FOLDS ORIENT	up PLUNG PLUNG UTCRO /Mn 2.17 2 s elvage	f RAN Etc	A L	JOINTS JOINTS JOINTS JOINTS	N EAN MENS i/c	TY			LTS ENT DISP SIVES ELATION
STRUC GEO TYPE - 405 -shea - post	ENTS: further CTURAL LOGY FOLDS ORIENT OI SCONY	Inf PLUNO PLUNO / Mn 2 ry 2 s elvago	f RAN Etc	A L	JOINTS	MENIS HENG	ŢŢ	IN YPE CO/		LTS ENT DISP SIVES ELATION DETAIL
STRUC GEO TYPE - Shea - Shea	ENTS: further CTURAL LOGY FOLDS ORIENT ORIENT	up PLUNG PLUNG /Mn 2er 2 s elvag	T E E E E E E E E E E E E E E E E E E E	A L	JOINTS	MENIS HENIS	TY	IN YPI		LTS ENT DISI

7685 az/o	. 0	υτο	ROP	DESC	RIPTIC	ICE	OR	м		
DATE		GEO	LOGIS	T	OUTO	ROP			SLI	DE/PHOTO
June	2	R	Ber	8	R	1100			10	
MAP 12 H	17	AER	HAL P	ното	SAM	PLE(S)				
ONGET	UDE E	-	- 1	LATING	EN	-	-		ELE	VATION
1	7720			5	4623	00			12	50m
				GEOL	OGY					
10.00	LITH	COL	OR	THICK	COMP.	GRAIN	R	5	FOS	SED.
UNIT	Link	W. ro.YR	SSY/A	2		f				EATORES
	6/or	3/2	213.141	26, 11,7			-	-		
- 6	esalt,	/mn	at	a la	to at	elesi	1e	1	140	phanaet
UNIT	LITH.		COL	F	THI	CK	AL	D	ESC	RIPTION
COAL			-							
	LITH.	ço	Lop	THICK	COMP.	SIZE	R	S	FOS	FEATURE
COMMI	ENTS:									
STRUC	TURAL		RAN	ING NO	ME	AN	TY	PE	ORIE	NT DISP.
GEO	LOGY						1			
	FOLD	PLU	NGE	1 14	JOINTS		T	11	TRU	FLATION
TYPE								1,72		
TYPE	0	UTCR	OP S	KETCH			-	0	AL C	DETAIL

DATE CEOLOGIST OUTEROP SUBJECTION JUNE Q R BERG ROOLQ MAP AERIAL PHOTO SAMPLE(S) 42 H/7 LONGLETUDE E LATUPODE N ELEVATION 67600 S46120 1265 M GEOLOGY UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEATUR 1 V0/ FY22 SYGA SM FOR SIZE R S FOS FEATUR COMMENTS: - SACHELE OVERIA:= by a MRCHUE MORE fulle valuance. Soch perphysicite UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEATUR UNIT LITH. COLOR THICK COMP. GRAIN DESCRIPTION COAL Valuance. Soch perphysicite UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED COMMENTS: STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT DIS GEOLOGY INTRUSIVES TYPE ORIENT PLUNGE JOINTS INTRUSIVES TYPE ORIENT PLUNGE JOINTS INTRUSIVES	DATE GEOLOGIST OUTCHOP SUBJECT OUTCHOP SUBJECTION GEOLOGIST CHOP SKETCH SUBJECT OUTCHOP SKETCH SUBJECT SUBJECT OUTCHOP SKETCH SUBJECT			101	CROP	DES	LRIP	IIC	IN FO	JK	IVI	lei	DE PHOT
Junc 2       K BOTS       KOULA         MAP       AERIAL PHOTO       SAMPLE(S)         1244/7       Iongutude E       LATUPODE N       ELEVATION         1000000000000000000000000000000000000	Junc 2       K BETS       KOULA         MAP       AERIAL PHOTO       SAMPLE(S)         92. H/7       LONGLTUDE       ELEVATION         1000000000000000000000000000000000000	DATE	~	GEO	CLOGIS	T	p	O	AI-			D.	DETHON
MAP     AERIAL PHOTO     SAMPLE(J)       92 H/7     IONGLEDDE E     LATUPODE N     ELEVATION       10000     546120     1265 m       GEOLOGY       UNIT     LITH.     COLOR     THICK     COMP.     GRAIN R     S FOS     SED       UNIT     LITH.     COLOR     THICK     COMP.     GRAIN R     S FOS     FEATUR       COMMENTS: Dadetite overland by a machine more failer value.       UNIT       1     LITH.     WOP     COAL     INTERVAL     DESCRIPTION       COMMENTS:       UNIT       LITH.     WOP       COAL INTERVAL       ZONE       COMMENTS:	MAP     AERIAL PHOTO     SAMPLE(S)       92 H/7     IONGLEVIDE E     LATUPODE N     ELEVATION       67600     S46120     1265 m       GEOLOGY       UNIT     LITH.     COLOR     THICK     COMP.     GRAIN R     S FOS FEATUR       COMMENTS: Dadeute overlan by a machine more feltere valuance. Joth performation       UNIT       LITH.     WOR     THICK     COMP.     GRAIN R     S FOS FEATUR       UNIT       LITH.     WOR     THICK     DESCRIPTION       COAL       INTRUCTURAL       BEDDING NO. TAKEN       TYPE ORIENT PLUNGE       JOINTS       INTRUSIVES       TYPE ORIENT PLUNGE       JOINTS       INTRUSIVES       TYPE ORIENT PLUNGE       JOINTS       INTRUSIVES       TYPE RELATION	June	×	K	Ren	+	-		Ul a	-	_	_	
LONGLITUDE     ELATIPODE     M     ELEVATION       67600     S46120     7265 m       GEOLOGY       UNIT     LITH.     COLOR       THICK COMP.     GRAIN R     S FOS FEATUR       1 VO/ FY72 STR/A 8 M     Fos FEATUR       COMMENTS:     SOMELITE OVERIGATE BY O MARGINE MORE       COMMENTS:       UNIT     LITH.     COLOR       THICK COMP.     GRAIN R     S FOS FEATUR       COLOR       THICK COMP.     GRAIN R     S FOS FEATUR       COLOR     THICK COMP.     GRAIN R     S FOS FEATUR       COLOR     THICK COMP.     GRAIN R     S FOS FEAT	LONGLITUDE E LATUPODE N SUBJECT STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT PLUNGE JOINTS TYPE RELATION	42 L	+1-7	AE	RIAL	ното		Am	(-)				
67600     546120     1265 m       GEOLOGY       UNIT     LITH. W F THICK COMP. GRAIN R S FOS FEATUR       1     1     1     0     1	67600     546120     1265 m       GEOLOGY       UNIT     LITH. WOR THICK COMP. GRAIN R S FOS FEATUR       1 VO/ FY72 SYR/ Sm F-of I       COMMENTS: Dadesite overlan by a massive more fulling value more	LONGIT	UDE E	-		LATITO	DE A	1		-		ELE	VATION
GEOLOGY       UNIT     LITH.     COLOR     THICK COMP. GRAIN R S FOS FEATUR       1     VO/ 1993 SYR/1 SM     For Feature       COMMENTS: DADELTE OVERTON BY O MARGINE MOTE       COMMENTS: DADELTE OVERTON BY O MARGINE MOTE       UNIT     LITH.     COLOR     THICK COMP. GRAIN R S FOS FEATUR       UNIT     LITH.     COLOR     THICK COMP. GRAIN R S FOS FEATUR       COMMENTS:       UNIT     LITH.     COLOR       THICK COMP. GRAIN R S FOS FEATUR       COMMENTS:	GEOLOGY       UNIT     LITH.     COMMENTS:     STRUCTURAL       INTRUSIVES       UNIT       LITH.     COLOR       THICK COMP.       GRAIN R     S FOS FEATUR       UNIT       LITH.     COLOR       THICK COMP.       GRAIN R     S FOS FEATUR       COLOR       THICK COMP.       GRAIN R     S FOS FEATUR       COLOR       THICK COMP.     GRAIN R     S FOS FEATUR       COLOR     THICK COMP.     GRAIN R     S FOS FEATUR       COMMENTS:	6	7600	Ĕ		5	461	20	)			12	65 m
UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEATUR 1 VO/ FY72 SYAA 8M FAND FAND FAND COMMENTS: - DADELTE OVERTAL BY O MARGINE MORE fulle: C valuance. Soth perphysion 2 LITH. COLOR THICK COMP. GRAIN R S FOS SED COAL 20NE COAL 20NE COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED COMMENTS: STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT DIS GEOLOGY HEAD INTERVAL DESCRIPTION COMMENTS: STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT DIS TYPE FOLDS INTRUSIVES TYPE FOLDS JOINTS INTRUSIVES TYPE COMMENTS:	UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEATUR 1 VO/ FY22 SYR/ 8M Faith S FOS FEATUR COMMENTS: - DADELIC OVERIGE BY G MARGINE MORE fuller vision c. Soth perphysicitic UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED. COAL 2010 COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED. COAL 2010 COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED. COMMENTS: UNIT LITH. BEDDING NO. TAKEN TYPE ORIENT DIS GEOLOGY FOLDS JOINTS INTRUSIVES TYPE FOLDS JOINTS INTRUSIVES TYPE ORIENT FLUNGE JOINTS COAL DETAIL					GEO	LOG	Y					
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COMMENTS: - Dadesite overlan by a madrice more felter vskame, both perphysite UNIT 2. LITH. V F COAL INTERVAL DESCRIPTION 2. COAL 2.	COMMENTS: - badesite overlain by a machine more fullie visition c. both perphyticita UNIT 2. LITH. W F COAL INTERVAL DESCRIPTION COAL ZONE COAL COAL COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED. COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED. COMMENTS: STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT DIS STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT DIS STRUCTURAL RANGE MEAN TYPE ORIENT DIS TYPE ORIENT PLUNGE JOINTS INTRUSIVES TYPE ORIENT PLUNGE JOINTS TYPE RELATION OUTCROP SKETCH COAL DETAIL	1	v0/	547/	5YB1	8m			f-vot				
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COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED 3 COMMENTS: STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT DI GEOLOGY HEAN TYPE ORIENT DI TYPE ORIENT PLUNGE JOINTS INTRUSIVES TYPE ORIENT PLUNGE COAL DETAIL	COMMENTS: UNIT LITH, COLOR THICK COMP. GRAIN R S FOS FEATUR 3 COMMENTS: STRUCTURAL REDDING NO, TAKEN TYPE ORIENT DIS GEOLOGY FOLDS INTRUSIVES TYPE ORIENT PLUNGE JOINTS INTRUSIVES TYPE ORIENT PLUNGE COAL DETAIL	ZONE					_	-		-	-		
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TYPE ORIENT PLUNGE TYPE RELATIO	OUTCROP SKETCH COAL DETAIL	GEO	EOLD	5		-	JOIN	TS			IN	TRU	SIVES
COAL DETAIL	OUTCROP SKETCH COAL DETAIL	TYPE	ORIENT	PL	UNGE	-				т	YPE	R	ELATION
OUTCROP SKETCH COAL DETAIL			0	UTC	ROP S	KETC	н	-			co	AL	DETAIL

685 82/05	0	UTCRO	JP D	ESCI	RIPTIC	N FL	JAN	n	Ter re	E PHOTO
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			G	EOL	OGY					
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UNIT 3 COMMI	LITH.	çolo	T	ніск	COMP.	GRAII	R	5	FOS	FEATUR
	ENTS:	COLO BE		G NO	COMP.	AN EAN	TY	PE	FAU	LTS ENT DIS
UNIT 3 COMMI STRUC GEO	ENTS:	BE	DDING	G NO	. TAKE	N	TY	PE	FAU	FEATUR
UNIT 3 COMME STRUC GEO	CTURAL CTURAL DLOGY FOLD ORIENT	BE BE		G NO	COMP.	N E A N	TY	PE IN YPI		FEATUR
	CTURAL CTURAL DLOGY FOLD ORIENT			G NO	COMP.		TY	IN Y PE		FEATUR
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UNIT 3 COMME STRUC GEO	LITH. ENTS: CTURAL LOGY FOLC ORIENT	BE BE T PLUNG	EDDINI RANGI	G NO			TY	IN YPE		FEATUR
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	. C	UT	CROP	DESC	RIPTIC	ON F	OR	M		
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COAL										
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7685 \$2/0	. 0	UTCF	REG	DESC	RIPTIC	DN F	ORI	м		
JUNE	2	GEOL	OGIS	T	R	CROP	r.		SLI	DE/PHOTO
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STRUC	I OCY									
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GEO		UTCRC	GE DP S			4	т <sup>.</sup>	IN YPE	AL C	DETAIL



7685 82/05	0	UTCROP	DESC	RIPTIC	ICE DN F	ORI	M 3	00	4
DATE		GEOLOGIS	T	OUTO	ROP			SLI	DE/PHOT
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			GEO	LOGY	-				
	LITH.	COLOR	THICK	COMP.	GRAIN	R	5	FOS	SED.
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COMMEN	VTS: CI	hymnin	ix, m	0.10. 1 (	685	51	18		
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TYPE	FOLDS	PLUNGE		JOINTS		T	IN'YPE	RE	LATIO
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7685 sz/4	,s (	олто	RE	DESC	RIP	TIC	ICE	OR	м		
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TYPE	FOLD	PLU	INGE		101	4TS		т	IN Y PE	TRU	ELATION
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RECONNAISSANCE OUTCROP DESCRIPTION FORM 7685 \$2/05 SLIDE/PHOTO OUTCROP DATE GEOLOGIST TUNE 3 R SAMPLE(S) AERIAL PHOTO MAP 12 H/ ELEVATION LATITUDE LONGITUDE 1070m 545120 GEOLOGY 4.5 -4.7 SED. GRAIN COLOR FOS R THICK COMP. s LITH. FEATURES SIZE UNIT w 54R4 NY VOI 10 m BAS - 15 2/10 COMMENTS: ALLY WITE VFG THICK COLOR DESCRIPTION UNIT LITH. COAL INTERVAL ž w COAL ZONE COMMENTS: ELLUMTION 4.7-4.9 1110 (m) FOS FEATURES GRAIN COLOR COMP. THICK R s LITH. SIZE UNIT 14 8 = 400 m 10 357 3 SED bands i caninal. COMMENTS: Iron Stand 558 - 3/tst BEDDING NO. TAKEN FAULTS STRUCTURAL MEAN TYPE ORIENT DISP. RANGE GEOLOGY INTRUSIVES JOINTS FOLDS TYPE RELATION TYPE ORIENT PLUNGE COAL DETAIL OUTCROP SKETCH 7457.8-4.7-4.9

3/82 H2 ADE C 19 5 0 LITH. Vo/	COLO WW	R F	HOTO ATITUE 545 GEOL	SAM	CROP	9		SLI ELE //	VATION
H2 JDE C 19 50 LITH. Vo/	COLO W		ATHTUE 545 GEOL	SAM	pre(s)			ELE //	VATION
LITH. 19 50 LITH. 10/ 7	COLO WE 5 ND C	DR F	GEOL	OGY	5			ELE //	VATION 36
LITH. Vo/	COLO WES	R F	GEOL	OGY	<u>-</u>	_			
LITH. 40/ 3 NTS: 19/	WDC	F	THICK						
VD/ 1	ND C	5411		COMP.	GRAIN	R	5	Fos	SED.
NTS: 19	NOC	111	310	AND	Fime	-	-	-	-
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		+	P (	UAL	INTERV	~	_		
LITH.	COLC	P#	THICK	COMP	GRAIN	R	s	FOS	SED.
NTS:		-	1	-		-			
TURAL	81	RAN	NG NO.	TAKE	N EAN	TYP	E	FAU	LTS
LOGY				1			IN	TRU	SIVES
ORIENT	PLUNG	se.	-	JOINTS	8	T	PE	R	ELATION
01	TCRO	P S	KETCH				:0/		DETAIL
	LITH. INTS: TURAL LOGY FOLDS ORIENT		LITH. COLOR W F INTS: TURAL BEDDI RAN LOGY FOLDS ORIENT PLUNGE	LITH. COLOR THICK	LITH. COLOR THICK COMP INTS: TURAL BEDDING NO. TAKE TURAL RANGE MI LOGY JOINTS ORIENT PLUNGE JOINTS OUTCROP SKETCH	LITH. COLOR THICK COMP. GRAIN SIZE INTS: TURAL BEDDING NO. TAKEN TURAL RANGE MEAN LOGY JOINTS ORIENT PLUNGE JOINTS OUTCROP SKETCH	LITH. COLOB THICK COMP. GRAIN R SIZE R INTS: TURAL BEDDING NO. TAKEN TURAL RANGE MEAN TYP LOGY JOINTS T ORIENT PLUNGE JOINTS T	LITH. COLOR THICK COMP. GRAIN R S INTS: TURAL BEDDING NO. TAKEN TURAL RANGE MEAN TYPE LOGY JOINTS IN ORIENT PLUNGE JOINTS IN OUTCROP SKETCH COA	LITH. COLOR THICK COMP. GRAIN R S FOS

7685 82/0 DATE		GEO	LOGI	DLJ		OUTO	ROP	0		SL	IDE,
JUNI	53/82	2 1	224	0		R	002	0			-
MAP 92	HZ	AEF	TAL	рното		SAM	PLE(S)	ŝ.			
LONGIT	UDE	-		LATITU	DE			-		ELE	VA
6	7920	)		54	51	90		_	_	1	13
				GEO	LO	GΥ	-	-	_		
UNIT	LITH.	COI	LOR	THICK	co	MP.	GRAIN	R	5	FOS	FE
1	SED .	15	613	-	Pit:	YYEE	Æ				
COMME	NTS: (	Emi	E.D.	e F	NE	in a	Can Ann	2	100	17-	- 90
UNIT	LITH	.	COL	OR		THI	CK	AL	D	ESC	RIP
COAL			**	-							
	LITH.	ço	LOP	тніся	K C1	омр.	GRAI	A H	s	FO	S FE
	LITH.	ço			K C(	OMP.	GRAI	4 8	s	FAU	S FE
	LITH.	ço	BEDD	THICH	к ст	AKE	GRAIT SIZE	4 FR	PE	FAU	S FE
	LITH, ENTS: TURAL LOGY FOLD ORIENT	CO W	BEDERAL	THICH	K C1	AKE ME	GRAIT SIZE	TY	PE	FAU	
UNIT 3 COMMI STRUC GEO	LITH. ENTS: TURAL LOGY FOLD ORIENT	PLU	BEDE RAI		к с.	AKE ME	GRAIT SIZE	TTY		FAU ORI	S FE
UNIT 3 COMMI STRUC GEO	LITH. ENTS: CTURAL LOGY FOLD ORIENT	PL				AKE ME	GRAIN	TY T	PE IN YPI	FAU ORI	S FE
	LITH. ENTS: CTURAL LOGY POLD ORIENT ORIENT			THICH		AKE ME	GRAIT SIZE	TTY	PE IN YPE	FAU	
	LITH. ENTS: CTURAL LOGY POLD ORIENT ORIENT		BEDE RAI	THICH		AKE ME		TY T	PE IN YPE	FAU ORI ITRUE AL	
	LITH. ENTS: TURAL LOGY POLD ORIENT ORIENT		BEDD RAI	THICH	к сс  _	AKE ME		TY		FAU ORI ITRU	S FE
	LITH. ENTS: CTURAL LOGY POLD ORIENT ORIENT ORIENT VOL PUL R VOL - TU	VIC	BEDD RAI	THICH	H AC	AKE ME NTS		TY	PE IN YPI		

7685 #2/0	·s 0	UTCR	REG	DESC	RIPTI	NCE	ORM	N	17	758
DATE	10	GEOL	OGIS	т	OUT	CROP			SLI	DE/PHOT
JUNE	53/52	RE	B		K	200	21			-
MAP	4/2	AERIA	AL P	ното	SAM	PLE(S)	-			
ONGIT	UDE	-	1	LATITU	DE	-	-	E	LEV	ATION
1	2030	0		54	520	5			11	95
				GEO	LOGY					
100000	LITH.	COLO	R	THICK	COMP.	GRAIN	R	5 F	os,	SED.
I	150 1	SAD1	E.	£ _	-	-				
сомме	NTS: IT	OUTC O	ROI	€ C⇒	NERED	ZF	A	n7	đ. A	
UNIT	LITH.	C	OLC	R	COAL	CK	AL	DE	SCR	IPTION
COAL	-		-	-					-	
COMME	NTS:		1.1							
3										
COMM	ENTS:									
CTDU	TUDAL	8	EDDI	ING NO	, TAKE	N		F	AUL	TE
GEO	LOGY	-	RAN	GE	MI	LAN	110	EU	RIL	AT DIST
	FOLD	-			JOINTS	8	TŸ	INT	RUS	LATION
TYPE	ONIENT	PLUN						-		
	0	UTCRO	PS	KETCH	4		0	OAL	LD	ETAIL

7685 82/05	0	UTCRO	P DES	CRIPTIC	JN FU	JRI	VI	22	C /
DATE	-du.	GEOLOGI	ST 22	OUT	CROP	7		IsLi	DEAPHO
JONE	\$ 32	- RC	9	×	004	-			-
92H	12	AERIAL	РНОТО	SAM	PLE(S)			~	
ONGIT	DE	-	LATITU	DE		_	1	ELE	VATION
67	980	)	54	517	0	_		12	50
			GEO	LOGY					
UNIT	LITH.	COLOR	THICK	COMP.	GRAIN	R	5	FOS	SED.
1	voli	san ca	5m	-	VFG				HERON
COMME	TS: WA	HTURE -	41	Win	arsil	5.10	1	NI	COL
UNIT	LITH.	COL	F	COAL	CK	AL	D	ESC	RIPTION
COAL									
		C C L C L L	10000000000	COMB	GRAIN	1.82	1 5	FOS	
UNIT 3	LITH.	COLOF	THICH	K COMP.	SIZE	R	s	FOS	FEATUR
	LITH.	COLOF	THIC	K COMP.	SIZE	R	S	FOS	FEATUR
	LITH.	BEDI	DING NO	COMP.	SIZE	R	S	FAU	FEATUR
	TURAL	BEDI	DING NG	COMP.	N EAN	TY	S	FAU	FEATUR
UNIT 3 COMME STRUC GEOI	LITH. NTS: TURAL LOGY FOLDS	BEDI	DING NG	D, TAKE	N EAN	TYI	S E IN	FAU	FEATUR
UNIT 3 COMME STRUC GEOL	LITH. NTS: TURAL LOGY FOLDS ORIENT	BEDI RA FLUNGE		D. TAKE	N	TY	S IN YPE	FAU	FEATUR
STRUC GEOL	LITH. NTS: TURAL OGY FOLDS ORIENT	BEDI RA FLUNGE			N	TYI	S IN YPE	FAU ORIE TRUS	FEATUR
UNIT 3 COMME STRUC GEOL TVPE	UITH. NTS: TURAL OGY POLDO ORIENT	BEDI RA PLUNGE			N EAN	TYI	S IN YPE	FAU ORIE	FEATUR
UNIT 3 COMME STRUC GEOL	UITH. NTS: TURAL OGY FOLDS ORIENT	BED RA PLUNGE		D. TAKE	N EAN	TYI		FAU ORIE TRUS	FEATURE INT DIS SIVES ELATIO
UNIT 3 COMME STRUC GEOL	UITH. NTS: TURAL OGY FOLDS ORIENT					TYI	S IN YPE	FAU ORIE TRUS	
UNIT 3 COMME STRUC GEOL TVPE	UTH. NTS: TURAL OGY FOLDO ORIENT	BEDI RA S PLUNGE				TYI	S IN YPE	FAU ORIE TRUS	
UNIT 3 COMME STRUC GEOL	UITH. NTS: TURAL OGY FOLDS ORIENT			D. TAKE		TY!	S IN YPE		ELATIO
UNIT 3 COMME STRUC GEOI	UITH. NTS: TURAL OGY POLDO ORIENT		SKETC			TYI	S IN YPE	FAUL ORIE	

DATE		GEO	OLOGIS	T	-	OUT	CROP			SLI	DE/P
JUNE	53/82	6	22B	2		R	00	z 3	3		-
MAP		AE	RIAL	рното	-	SAM	PLE(S)	1	-	-	
9	2H/2								4		
LONGIT	UDE	-		LATIT	JDE					ELE	VAT
63	130-			54	56	92.	>			1.5	20
				GEO	LC	GY					
UNIT	LITH.	CO W	LOR	THIC	ĸc	OMP.	GRAIN	R	s	FOS	FEA
1	lov	5 YE	NY	11	6	ND.	1	-		1	
COMME	NTS: N	10	DE	SCR	18	10	200	n)	15	-	
				ULIT	20	BORI	14/2 -	+ 1	ah	1.6	Cr.
UNIT	LITH		W	F	co	AL	INTERV	AL	D	ESC	RIPT
ZONE								_	_		
	LITH	co	0LOB	THIC	ĸ	OMP.	GRAI	R	s	FOS	FEA
UNIT 3	LITH.	ço	PLOP	тніс	к	OMP.	GRAIT	¥ R	s	FOS	FEA
UNIT 3 COMME	LITH.	ço	PLOF	тніс	к	OMP.	GRAIT	R	s	FOS	S FEA
UNIT 3 COMME	LITH.	ço	BEDD	THIC	к і	COMP.	GRAIT	R	s	FAU	FEA
UNIT 3 COMME STRUC GEO	LITH.	ço	BEDD	THIC	к 0.	TAKE ME	GRAIT SIZE	Y R	PE	FAU	S FEA
	LITH. INTS: TURAL LOGY	C CO	BEDD	THIC	о. 	TAKE ME	GRAIT SIZE N N E A N	Y R TY	S PE IN YPE	FAU	SFEA
UNIT 3 COMME STRUC GEO	LITH. INTS: TURAL LOGY FOLD: ORIENT	S PLI	BEDD	THIC	к 0, 	TAKE	GRAIT SIZE	Y R	S PE IN YPE	FAU	ENT SIVE
UNIT 3 COMME STRUC GEO	LITH. INTS: TURAL LOGY FOLD ORIENT	S PLI			к 0, јс	TAKE ME	GRAIT SIZE	Y R	S PE IN YPE	FAU ORII TRU R	SIVE ENT SIVE
UNIT 3 COMME STRUC GEO	LITH. INTS: TURAL LOGY FOLD ORIENT	CO W	BEDD RAN RAN ROP S	THIC	к 0,  ло	TAKE ME	GRAIT SIZE	Y R TY	S PE IN YPE	FAU ORII	LTS ENT SIVE ELA
UNIT 3 COMME STRUC GEO	LITH. INTS: TURAL LOGY FOLD ORIENT	s PLUTC	BEDD RAN RAN BEDD RAN RAN BEDD RAN RAN BEDD RAN RAN BEDD RAN RAN BEDD RAN RAN BEDD RAN RAN BEDD RAN RAN RAN BEDD RAN RAN RAN RAN RAN RAN RAN RAN RAN RAN		к 	TAKE	GRAIT	Y R TY	PE IN YPE	FAU ORII	
UNIT 3 COMME STRUC GEO	LITH. INTS: TURAL LOGY FOLD ORIENT	S PLU	BEDD RAN UNGE 3 Km 8 Km	THIC	к 	TAKE ME INTS	GRAIT SIZE	Y R	PE IN YPE	FAU ORII TRU AL I	
UNIT 3 COMME STRUC GEO	LITH. INTS: TURAL LOGY FOLD: ORIENT		BEDD RAN UNGE ROP S 3 Km		к ( )с	TAKE ME DINTS	GRAIT	Y R		FAU ORII	
UNIT 3 COMME STRUC GEO	LITH. INTS: TURAL LOGY FOLD ORIENT	CO W	BEDD RAN ROP S 3 Em 8 km		к 	TAKE ME DINTS	GRAIT	T TY	PE IN YPE	FAU ORII TRU AL I	
UNIT 3 COMME STRUC GEO	LITH. INTS: TURAL LOGY FOLD ORIENT		BEDD RAN RAN SKM	THIC ING N GE	к і 	TAKE ME INTS	GRAIT	Y R T		FAU ORII TRU	
UNIT 3 COMME STRUC GEO	LITH. INTS: TURAL LOGY ORIENT	S PLUTC	BEDD RAN UNGE ROP S 3 Em 8 km	THIC	к ( ) 	TAKE ME INTS		Y R TY	PE IN YPE CO	FAU ORII TRU AL I	ENT SIVE
	LITH. INTS: TURAL LOGY FOLD: ORIENT	s PLUTC	BEDD RAN UNGE ROP S 3 Km	ING N NGE	к п 	TAKE ME Jork		Y R TY		FAU ORII	
	LITH. INTS: TURAL LOGY FOLD ORIENT	S PLU	BEDD RAN UNGE	THIC	к і 	TAKE ME JINTS		TTY	S IN YPE CO	FAU ORII TRU	ELA SIVE

ings eries	(	DUT	CROP	DESC	RIPTIC	ON FO	DR	M	1	nr Inue
DATE		GEO	LOGIS	T	OUT	CROP	14	e	SL	DEIPHO
JUNE		F	LB		R	002	-/			
MAP		AER	RIAL I	рното	SAM	PLE(S)	10	-	1	matt
92					PI	a -	5:	7	5	
ONGITU	DE	-	1	LATITU	DE	-			ELE	VATION
682	60			54	5015	5			13	540
				GEOI	LOGY					
1000	LITH.	co	LOR	THICK	COMP.	GRAIN	R	s	Fos	SED.
I	640	1PJK	NJ	Zm		ES				
COMMEN	TSI	6/6	E. Fa	201	01110	1. 1	-	64	-1	1451
See	Cash	2 -	000	LDBE	PZ-	รากน	-	2	2	Loo
UNIT		-	COL	OR	THI	CK		D	ESC	RIPTIO
COAL	LITH		w	F	COAL	INTERV	AL			
ZONE							_	_	-	
		0								
STRUCT	URAL	-	BEDD	ING NO	. TAKE	N	TY	PE	FAU	ENT DI
STRUCT	URAL	-	RAP	ING NO	ME	NEAN	TY	PE	ORI	ENT DI
STRUCT GEOL	URAL OGY	S	RAN	ING NO	JOINTS	N EAN	TY		TRU	SIVES
STRUCT GEOL	FOLD	S PLI	RAN	ING NO	JOINTS	N E A N	TY	IN Y PE	TRU R	SIVES
STRUCT GEOLI TYPE		PLU	BEDD RAN	ING NO		N EAN	TY		TRU AL	ENT DI
STRUCT GEOL	FOLD ORIENT	UTCI	BEDD RAN	KETCH		EAN EAN	T Y I		TRU	ENT DI
STRUCT GEOLO TYPE		UTCI	BEDD RAN	ING NO		EAN GDE	T		TRU R	LTS ENT DIS SIVES ELATIO
STRUCT GEOLI TYPE		UTC	BEDD RAT	KETCH	EQC	AN CASE	T	IN YPE	TRU AL	LTS ENT DI
STRUCT GEOLI TYPE	OGY FOLD ORIENT	S PLL	ROP S	Ma	Eoc *ix	EAN CRUE	T		TRU TRU	LTS ENT DIS SIVES ELATIO
STRUCT GEOLO TYPE	POLD ORIENT	UTCI S COI	ROP S	Ma	E DE	CAJE	T			LTS ENT DIS SIVES ELATIO
STRUCT GEOLO TYPE	POLD ORIENT	Con 5	ROP S	Ma	E DC	CANE	TV)		TRU ORI	LTS ENT DIS SIVES ELATIO
STRUCT GEOLO TYPE	POLD ORIENT	Con 5	ROP S	Ma Ma	Hik	CAJE	<u>T</u> ¥!	IN YPE	TRU R	LTS ENT DIS SIVES ELATIO
STRUCT GEOLO TYPE	FOLD ORIENT	5 C 01 5	ROP S	Ma	E CC	CADE	<u>T</u>	IN YPE	TRUE R	LTS ENT DIS SIVES ELATIO
STRUCT GEOLI TYPE	FOLD ORIENT	S PLU	ROP S	Ma Ma	Eac *ik	CAJE	T		TRU AL	LTS ENT DIS SIVES ELATIO
STRUCT GEOLI TYPE	POLD ORIENT	S PLU S COI	ROP S	Ma Ma	Eac *ik	CANE	T		TRU AL	

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7685 \$2/4	s O	UTCF	REG	DES	CR	IPTIC	ICE	OR	м	6	3.0
DATE		GEOL	0615	T		OUT	CROP			SLI	DE/PHOT
Jun	1	14	- 6			RG	200	5			
MAP		AERIA	AL F	рното		SAM	PLE(S)	à.,		0.1	
921	HZ		-			Te	c, b,	5			
ONGIT	0DE	6		LATIT	IDE 14	99	-			ELE	VATION
0	0.10	-	-	GEO	LO	GY				- 65	
	LITH.	COLC	R	THICK	k c	OMP.	GRAIN	R	8	FOS	SED.
UNIT	Mar	Va	-	44	+	-	Var .	40	D.	(and the second	hur
Vol	NTS: VE	it he	150	in al		e ki	30	6	Z	ha	le,351 ≈1
UNIT	LITH.	. 9	OL	OR	co	AL	CK	AL	D	ESCH	RIPTION
COAL		-									
	LITH.	COLO	op	тніс	ĸ	OMP.	GRAIN	R	5	FOS	SED.
	LITH.	COLO	op	тніс	КС	OMP.	GRAIN	R	5	FOS	SED.
	LITH.	COLO W BI	EDD	THIC	ю.	TAKE	GRAIN	TY	5 PE	FAUI	SED. FEATUR
	LITH. ENTS: CTURAL DLOGY FOLD: ORIENT	EI BI	EDD RAN	THIC	к (	TAKE	GRAIN SIZE	4 R TY	PE	FAU	SED. FEATUR
UNIT 3 COMM STRUC GEO	LITH. ENTS: CTURAL DLOGY FOLDO ORIENT		GE	THIC	к с 	TAKE	GRAIN SIZE	4 R TY	5 IN VPE	FAUI ORIE	SED. FEATUR
	LITH. ENTS: CTURAL DLOGY POLDO ORIENT	S PLUN	EDD S	ING N IGE				TY	S IN YPE	FAU ORIE TRUI	SED. FEATUR

768	5 sz/o	. 0	υтс	ROP	DE	NA	ISSAN	NCE	DR	м	68	.7
DA	TE		GEO	LOGI	st		OUT	CROP			SLI	DE/PHOTO
	Ton	E 3/82	- F	2L	B		R	002	-60			10
M	AP	H 7	AER	IAL	рното	0	SAM	PLE(S)				
_	10	-				11.00			_	-	ELE	VATION
LO	68	540			57	4.	500	0			15	40
	1				GEO	DL	OGY					
		LITH.	COL	OR	THIC	ĸ	COMP.	GRAIN	R	5	FOS	SED. FEATURE
U	I	in 1	Su	N2	IM	1	RAS	VEG	-	-	6	-
co	MME	NTS: YE	Ey.	VEE	Y F AUE	6.	Nola	anii	-	n	FE	A)
U	NIT	LITH.		COL	OR	-	THI	CK		p	ESC	RIPTION
c	OAL		-	W		C	SAL	MILERY.	184	-	-	
Z	ONE	NTC!				-			-	-	-	-
	TINIT 1	LITH.	çoi	Lob	THI	CK	COMP.	SIZE	R	s	POS	FEATURE
C	OMME	INTS:										
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	GEO	LOGY		KAI	1.012	-	1					
	-	FOLDS		NOF	1	J	OINTS		т	IN	TRU	ELATION
-	TYPE	ONIENT	PLU	non	1							
	-	01	TCR	OP 1	SKET	сн			.9	0	AL I	DETAIL
												1.5

DATE CEOLOGIST OUTCROP ADDEL SUNE3/2 PLD PLD PLD PLD PLD PLD PLD PLD	SED.
MAP  AERIAL PHOTO  SAMPLE(S)    92H/2  P27-Congli    LONGITUDE  LATITUDE  ELEVA    1  0100  545095  173    GEOLOGY    UNIT  LITH.  COLOP    THICK COMP. GRAIN R 5 FOS FI    COMMENTS: VERY WEATHERED CONGL CLAS    VAR POUNDING    UNIT  LITH.  COLOP    THICK COMP. GRAIN R 5 FOS FI    COMMENTS: VERY WEATHERED CONGL CLAS    VAR POUNDING    UNIT    LITH.    COLOP THICK COMP. GRAIN R 5 FOS FI    COMMENTS:    STRUCTURAL BEDDING NO. TAKEN TYPE ORIEN    GODOGY    INTRUSI    TYPE ORIENT FLUNGE    OUTCROP SKETCH    OUTCROP SKETCH	SED.
MAP  AERIAL PHOTO  SAMPLE(S)    92H/2  P27-congli    LONGITUDE  LATITUDE  ELEVI    68650  S45095  173    GEOLOGY    UNIT  LITH. COLOGY    GEOLOGY    UNIT    LITH. COLOGY    COMMENTS: VERY    VAR POUNDING    UNIT    LITH. COLOF    THICK COMP. GRAIN R    STRUCTURAL    BEDDING NO. TAKEN    TYPE ORIENT    JOINTS    INTRUSI    OUTCROP SKETCH	ATION 30 SED. EATUP
LONGITUDE LATITUDE ELEVA 68650 S45095 I7 GEOLOGY UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FO COMMENTS: VERY WEATHERED CONSCL CLASS UNIT LITH. W OF COAL INTERVAL DESCRI COAL 20NE COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FO COMMENTS: STRUCTURAL BEDDING NO. TAKEN TYPE ORIEN GEOLOGY AND SOLOR THICK COMP. GRAIN R S FOS FOS FOS FOS FOS FOS FOS FOS FOS F	SED.
GEOLOGY    UNIT  LITH.  COLOR  THICK COMP. GRAIN R S FOS FI    COMMENTS: VERY WERTHERED CONACL - CLASS    UNIT    UNIT    LITH.    COLOR    THICK COMP. GRAIN R S FOS FI    UNIT    LITH.    COLOR    THICK COMP. GRAIN R S FOS FI    COMMENTS:    UNIT    LITH.    COLOR    THICK COMP. GRAIN R S FOS FI    COMMENTS:    UNIT    LITH.    COLOR    THICK COMP. GRAIN R S FOS FI    COMMENTS:    STRUCTURAL    BEDDING NO. TAKEN    TYPE ORIENT    JOINTS    INTRUSI    OUTCROP SKETCH    OUTCROP SKETCH	SED. EATUP
UNIT LITH. COLOR THICK COMP. GRAIN R 5 FOS FI UNIT LITH. W F COAL INTERVAL DESCRI COMMENTS: VERY WEATHERED CONAC CLAS VAR POUNTING UNIT LITH. W F COAL INTERVAL DESCRI COAL ZONE COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R 5 FOS F COMMENTS: UNIT LITH. W F COAL INTERVAL DESCRI COMMENTS: UNIT LITH. BEDDING NO. TAKEN TYPE ORIEN STRUCTURAL BEDDING NO. TAKEN TYPE ORIEN TYPE ORIENT FLUNGE JOINTS INTERVAL OUTCROP SKETCH COAL DESCRI	SED.
UNIT LITH. WE'P THICK COMP. SIZE R S POS FI COMMENTS: VERY WEATHERED CONAC CLAS VAR FOUNDEND A UNIT LITH. COLOR THICK COAL ZONE COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS F COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS F COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS F COMMENTS: UNIT LITH. BEDDING NO. TAKEN TYPE ORIEN GEOLOGY FOLDS INTS INTRUSI TYPE ORIENT PLUNGE JOINTS INTRUSI TYPE ORIENT PLUNGE COAL COAL DE	ETTS
COMMENTS: VERY WERTHERED CONSC CLAS VAR FOUNDING UNIT LITH. COLOR THICK COAL ZONE COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS COMMENTS: STRUCTURAL BEDDING NO. TAKEN TYPE ORIEN GEOLOGY FOLDS INTS INTRUSI TYPE ORIENT PLUNGE JOINTS INTRUSI TYPE ORIENT PLUNGE COAL DE	ETS
COMMENTS: VERY WEATHERED CONAC CLAS VAR FOUNDING UNIT LITH. W F COAL INTERVAL DESCRI COAL ZONE COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SIZE R S FOS COMMENTS: STRUCTURAL BEDDING NO. TAKEN TYPE ORIEN GEOLOGY HEAN TYPE ORIEN TYPE ORIENT PLUNGE JOINTS INTRUSI TYPE ORIENT PLUNGE COAL DESCRIPTION OF THE COAL DES	ET S
UNIT LITH. COLOR THICK DESCRI 2 COAL 2 COAL	IPTION
2  LITH.  W  F  COAL    COAL  ZONE  INTERVAL    ZONE  INTERVAL    COMMENTS:      UNIT  LITH.  COLOR  THICK  COMP.  GRAIN  R  S  FOS    UNIT  LITH.  COLOR  THICK  COMP.  GRAIN  R  S  FOS    COMMENTS:      STRUCTURAL  BEDDING  NO.  TAKEN  FAULT    GEOLOGY  INTRUSI  INTRUSI    TYPE  FOLDS  JOINTS  INTRUSI    OUTCROP SKETCH  COAL  DE	
ZONE COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS F 3 COMMENTS: STRUCTURAL BEDDING NO. TAKEN TYPE ORIEN GEOLOGY FAULT TYPE ORIENT PLUNGE JOINTS INTRUSI TYPE ORIENT PLUNGE JOINTS TYPE REL OUTCROP SKETCH COAL DE	
COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS F 3 COMMENTS: STRUCTURAL BEDDING NO. TAKEN TYPE ORIEN GEOLOGY FAULT TYPE FOLDS JOINTS INTRUSI TYPE ORIENT FLUNGE JOINTS COAL DE	
STRUCTURAL RANGE MEAN TYPE ORIEN GEOLOGY INTRUSI TYPE ORIENT PLUNGE JOINTS INTRUSI OUTCROP SKETCH COAL DE	
GEOLOGY	TS DI
OUTCROP SKETCH	
OUTCROP SKETCH COAL DE	LATIO
	ETAI

7685 #2/0	s 0	UT	CROP	DESC	RIPTI	ON F	OR	M	71	14
DATE		GEO	DLOGIS	iT.	OUT	CROP			SL	IDE/PHC
JUN	= 3/82	R	B		R	602	8			12
MAP 921	+12	AE	RIAL P	рното	SAM	PLE(S)	6	-		
	1000	_			DE AL				ELE	VATIO
LONGIT	2621	5	- 1	154	509	0			B	760
	2021			GEOI	OGY	1			-	
1111	LITH.	co	LOR	THICK	COMP.	GRAIN	R	5	FOS	SED
UNIT	Mal	W IDJF	103	Zm	bas.	1.9		-	-	1 MARTE
COMME	NTS: VI	14	har	d-k	ew ol	WINE	p	-	0.5	
UNIT	1178	-	COL	OR	тні	ск		D	ESC	RIPTIO
COAL	Line.	-	w	F	COAL	INTERV	AL	-		
ZONE							-	_		
	LITH,	ço	LOP	тніск	COMP.	GRAIN	R	8	Fos	FEATU
	LITH.	ço	LOP	тніск	COMP.	GRAIN	R	s	FOS	FEATU
	LITH,	ço		THICK	COMP	GRAIN	d P	S	FOS	FEATU
	LITH,	ço	BEDD	THICK	, TAKE	GRAIN SIZE	H H	PE	FAU	FEATU
UNIT 3 COMMI STRUC GEO	LITH, ENTS: CTURAL LOGY	CO W	BEDD	THICK	COMP.	GRAIN SIZE	TY	PE	FAU	FEATU
UNIT 3 COMMI STRUC GEO	LITH, ENTS: CTURAL LOGY FOLD ORIENT	S PLL	BEDD	ING NO	, TAKE	GRAIN SIZE	TY T	PE	FAU ORI TRU	SED FEATU
UNIT 3 COMMI STRUC GEO	LITH, ENTS: CTURAL LOGY FOLD ORIENT	S PLU	BEDD RAN	THICK	, TAKE	GRAIN SIZE	4 R TY	S PE IN YPE	FAU ORI TRU	ELATIO
UNIT 3 COMMI STRUC GEO TYPE	LITH, ENTS: CTURAL LOGY FOLD ORIENT	S PLU	BEDD RAN ROP S	ING NO		GRAIN	TY	S PE IN Y PE	FAU ORI TRU	SIVES ELATIO
UNIT 3 COMMI STRUC GEO TYPE	LITH, ENTS: CTURAL LOGY FOLD ORIENT	S PLU	BEDD RAN UNGE	ING NO	TAKE ME JOINTS	GRAIN	TY	S IN YPE	FAU ORI TRU AL	ELTS ENT DI SIVES ELATIO
UNIT 3 COMMI STRUC GEO TYPE	LITH, ENTS: CTURAL LOGY FOLD ORIENT	S PLU	BEDD RAN UNGE ROP S	ING NO	, TAKE JOINTS	GRAIN	TY	IN YPE	FOS ORI TRU AL	SIVES ELATIO
UNIT 3 COMMI STRUC GEO TYPE	LITH, ENTS: TURAL LOGY FOLD ORIENT	S PLU	BEDD RAN BAN BAN BAN BAN BAN Ver Yer	ING NO	, TAKE JOINTS JOINTS		ч н тү -	PE IN YPE	FAU ORI TRU AL	SELTS FEATU
UNIT 3 COMMI STRUC GEO TYPE	LITH, LITH, ENTS: CTURAL LOGY FOLD ORIENT	S PLUTC	BEDD RAN UNGE	THICK	, TAKE JOINTS		TYT	IN YPE		ENT DI
UNIT 3 COMMI STRUC GEO TYPE	LITH, ENTS: TURAL LOGY FOLD ORIENT	S PLU	BEDD RAN BAN BEDD RAN RAN RAN RAN RAN RAN RAN RAN RAN RAN	ING NO	, TAKE MI JOINTS		TY	PE IN Y PE	FAU ORI	SIVES ELATIO
UNIT 3 COMMI STRUC GEO TYPE	LITH, ENTS: TURAL LOGY FOLD ORIENT	S PLA	BEDD RAN UNGE	ING NO	TAKE ME JOINTS		T Y	S IN YPE CO		SIVES DETAI
UNIT 3 COMMI STRUC GEO TYPE	LITH, ENTS: CTURAL LOGY FOLD ORIENT	S PLU	BEDD RAN BANGE ROP S	ING NO IGE	, TAKE JOINTS		4 R TV	S IN YPE		SIVES ELATIO
UNIT 3 COMMI STRUC GEO TYPE	LITH, ENTS: TURAL LOGY FOLD ORIENT	S PLU	BEDD RAN BEDD RAN RAN RAN RAN RAN RAN RAN RAN RAN RAN	ING NO	, TAKE JOINTS		TV	S IN Y PE	FAU ORI TRU AL	SIVES ELATIO

DE 3/8 H/2 8480	GEO AEF	RUS	нт В Рното		R SAMI P2	002 PLE(S)	9	12	su to	DE/PHOTO
NE 3/8 H/2 8480	AER	RCJ	Рното		R. SAM P2	002 PLE(S)	0	12	+0	
H/2 8480	AER	HAL I	рното		SAM P2	9.E(S)	0	14	+0	1.10
9480	-	- 1								e of
8480			LATITU	DE	-	_	-	1	ELE	VATION
	l		54	40	190	>			1	78
			GEO	LO	GY					
LITH.	COI	OR	THIC	K C	OMP.	GRAIN	R	5	FOS	SED.
500	NYF.	10-JA	<td>, 5</td> <td>st</td> <td>63</td> <td>-</td> <td>1</td> <td>-</td> <td>massive</td>	, 5	st	63	-	1	-	massive
NTS: VEI	23	mas	eloc t no	- A	+ .!	te				
LITH.		COL	OR	co	THI	CK	AL	D	ESC	RIPTION
	-									
NTSI										
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TUDAL		BEDD	ING N	0.	TAKE	N			FAU	LTS
LOGY	-	RAN	IGE	-	ME	AN	111	· E.	Onn	SHI MINT
FOLDS	5			10	INTS	-	T	IN	TRU	SIVES
ORIENT	PLU	NGE	1							
01	UTCF	ROP S	KETC	н			4	:0/	AL I	DETAIL
	LITH.	LITH. W SED SAL NTS: VEC 1 5 - LITH. LITH. NTS: LITH. CO ENTS: CTURAL LOGY FOLDS ORIENT PLU	LITH. W F SED SILLITH. NTS: VEL SMAA - CLOR - CLOR	LITH. W F INIC.	LITH. W F INICK C	LITH. W F INICK COMP. SED ST ICH C/m SST NTS: VELS MALL OC - I - LITH. COLOR THI LITH. COLOR THI NTS: LITH. COLOR THICK COMP. FOLDS DING NO. TAKES ORIENT PLUNGE JOINTS OUTCROP SKETCH	LITH. W F INCK COMP. SIZE	LITH. W F INICK COMP. SIZE U SED SIX INA CIM SST A - NTS: VERSIMAL OC - I - DIMOST WARTS. LITH. COLOR THICK COMP. GRAIN R NTS: LITH. COLOR THICK COMP. GRAIN R SIZE R ENTS: CTURAL BEDDING NO. TAKEN TURAL RANGE MEAN TYI LOGY JOINTS T ONIENT PLUNGE JOINTS T OUTCROP SKETCH	LITH. W F INICK COMP. SIZE I C SED SIX CHA C/m SST A - NTS: VICE Small oc - I - DIMOST SUBJECT 3 - LITH. COLOR THICK COMP. GRAIN R NTS: LITH. COLOR THICK COMP. GRAIN R NTS: LITH. BEDDING NO. TAKEN ENTS: CTURAL BEDDING NO. TAKEN TYPE COLORY INICK COMP. SIZE R SIZE R	LITH. W F INCK COMP. SIZE A DIAL SED SK IPH C/m SST A NTS: VERSIMAL DC - F - DIMOST JUARTS-TE LITH. COLOR THICK COMP. GRAIN DESC NTS: LITH. COLOB THICK COMP. GRAIN R S FOS ENTS: CTURAL BEDDING NO. TAKEN TYPE ORIE LOGY JOINTS INTRU- ORIENT PLUNGE JOINTS INTRU- TYPE R

7685 az/0	. 0	UTCROP	DESC	RIPTIC	NCE	RM		
DATE	/	GEOLOGIS	T	OUT	CROP		SL	DE/PHOT
JUN	53/82	RL	8	1	0000	0		-
MAP GZ	4/2	AERIAL	рното	SAM	PLE(S)	-		
ONCIT	105	1	LATITUS	DE		-	ELE	VATION
6	7790	>	545	130	í		13	200
			GEOL	OGY				
	LITH.	COLOR	THICK	COMP.		1 5	Fos	SED.
1	V61	shy pay	10m	AND				
сомме	NTS: TO	FEACO	5005	-P	YROCL	n	5776	4
UNIT	LITH.	COL	OR	THI	CK		DESC	RIPTION
COAL	-							
COMME	NTSI	-						
UNIT 3	LITH.	W	THICK	COMP.	SIZE	1		FEATUR
COMMI	ENTS:		-					
CTRU	TUPAL	BEDD	ING NO	TAKE	N	VDE	FAU	LTS
GEO	LOGY	RAP	IGE	ME	AN I	11.15	Unit	
	FOLDS	-	-	JOINTS	/	TYP	E R	ELATION
TYPE	OHIENT	PLUNSE	1					
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7685 \$2/0	. 0	RE	CONN/	RIPTI	ON FO	3.5 RM		
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UN	6618	+HH &	2#	71	001		F	1.4
92+	4/1	AERIAL	рното	SAM	PLE(S)	rgi	nafe	18
ONGIT	UDEE	-	LATITU	DE		T	ELEV	ATION
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-	1.1		GEOI	OGY				
	LITH.	COLOR	THICK	COMP.	GRAIN SIZE	2 5	FOS	SED.
1	GG-L	506	30m		VEL 0	P	1	
COMME	NTS:	MAS	55100	E //	nmi	950	RE	
UNIT	LITH.	COL	OR	THI	CK	01	ESCR	IPTION
COAL								
COMME	NTS:							
3		WF			SILE			
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CTDI	TURAL	BEDD	NG NO	TAKE	N	VAR	AUL	15. NT DIS
GEO	LOGY	RA	NGE	M	LAN T	TPE I	URIE	at bis
	FOLD	PLUNGE		JOINTS		TYPE	RUS	LATION
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				GEO	LOGY	S				
UNIT	LITH.	CO	LOR	THICK	COMP	GRAIN	R	8	FOS	FE
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COMMEN	TS: 🤿	mm	C P	IS HE	51					
UNIT		-	COL	OR	тн	іск	-		ESC	RU
COAL	LITH		w	F	COAL	INTERV	AL			
ZONE					_	-	-			
	LITH.	ço	LOB	THICK	COMP	GRAI	N R	5	FO	5 F1
	LITH.	ço	BEDD	THICK	COMP	GRAIN	R	5	FOS	FI
	URAL	ço	BEDD	THICK	COMP	GRAII SIZE	TY	S PE	FAU	
UNIT 3 COMMEN STRUCT GEOL	URAL OGY	co w	BEDD	THICK	COMP	GRAII SIZE	TY	PE	FAU	SIVEL
UNIT 3 COMMEN STRUCT GEOL	URAL OGY FOLD: ORIENT	S PLI	BEDD	THICK		GRAIN SIZE	TY	PE	FAU	5 FI
UNIT 3 COMMEN STRUCT GEOL	URAL OGY FOLD ORIENT	S PLI	BEDD RAN	THICK	COMP	- GRAII SIZE	TY TY	PE IN YPI	FAU	SIVEL
UNIT 3 COMMEN STRUCT GEOL	URAL OGY FOLD ORIENT	S PLU	BEDD RAN		COMP	N E AN	TY	PE IN YPE	FAU	5 FI
UNIT 3 COMMEN STRUCT GEOL	UTS: TURAL OGY FOLD ORIENT	S PLU	BEDD RAN RAN	THICH	COMP	N EAN	TY	PE IN VPI		SIVEL
UNIT 3 COMMEN STRUCT GEOL	URAL OGY FOLD ORIENT	S PLU	BEDD RAN UNGE	THICK	COMP	CN E AN	TTY	PE IN YPI	FOS ORI TRUE R	SIVEL
UNIT 3 COMMEN STRUCT GEOL	URAL OGY FOLD: ORIENT	S PLU	BEDD RAN			IN EAN	TY TY T	PE IN VPI		SIVEL
UNIT 3 COMMEN STRUCT GEOL	URAL OGY FOLD ORIENT	S PLU	BEDD RAN UNGE	THICH	COMP	N EAN	TY	PE IN YPE	FAU ORI TRUE R	SIVEL
UNIT 3 COMMEN STRUCT GEOL	URAL OGY FOLD ORIENT	S PLU		THICK	COMP	N EAN	TTY	PE IN Y PF	FAU ORI TRU AL	SIVEL
UNIT 3 COMMEN STRUCT GEOL	URAL OGY FOLD: ORIENT	S PLUTC	BEDD RAN UNGE				TY TY	PE IN YPE	FAU	SIVEL
UNIT 3 COMMEN STRUCT GEOL	URAL OGY FOLD ORIENT	S PLU			COMP	N EAN	TY	PE IN Y PI		5 FI

DATE	Jak-	GEOLOGIS	Tela	OUTO	TROP	-0		SLI	DE
Jan	11/0	KD	E ACTO	SAM	PLE(S)	-	-	_	-
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			GEOI	LOGY	Lan alla	_			_
UNIT	LITH.	COLOR	THICK	COMP.	SIZE	R	S	FOS	FE
1	CONAL	5/2	Im	LITH	VOT	n	r		
COMME	NTS: PR	OBABLY	y Vai	C					
UNIT	LITH.	COL	OR	COAL	CK	AL	D	ESC	RI
COAL					-				_
	LITH.	COLOP	THICK	COMP.	GRAI	R	s	FOS	FI
	LITH.	COLOP WOLOP	THICK	COMP.	GRAII	R	5	FOS	F
	LITH.	BEDD	THICK	COMP.	GRAII SIZE	TY	PE	FAU	EN
	LITH. INTS: TURAL LOGY FOLD: ORIENT	BEDD RAT PLUNGE	THICK	COMP.	GRAII SIZE	TY	PE	FAU	SFI
UNIT 3 COMME STRUC GEO	LITH.		THICK	COMP.	GRAII SIZE	TY TY	PE IN YPI	FAU ORI TRU E R	
STRUC GEO		BEDD RAT PLUNGE	SKETCH	JOINTS		TTY			SILT

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DATE	202	GEC	2-7	ST	00	200	e			
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92	-1/15	AEI	RIAL	РНОТО	SAI	ROU	15	-1	-	P
ONGIT	ubé E			ERTITU	06- N				ELE	VATION
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				GEO	LOGY	,				
	LITH.	co	LOR	THICK	COMP	GRAIN	R	5	FOS	SED.
UNIT	coll_	inth.	53P9	51500	n Vol	- Cinc	-			
OMME	NTS: - U	14	ours	0 54	- lock	2 VC	i k	47	1.003	ppect
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UNIT	LITH.		COL	OR	COAL	ICK	AL	D	ESC	RIPTION
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COMME	INTS:					_	<u>.</u>			
COMME	INTS:		BEDI		. TAKE	EN			FAU	
STRUC	TURAL		BEDI	NGE NG	5. TAKE	EAN	TY	PE	FAU	LTS ENT DIS
STRUC GEO	TURAL LOGY		BEDG	NGE	D. TAKE	EAN	TY	PE	FAU ORII	LTS ENT DIS
STRUC GEO	TURAL LOGY FOLDS ORIENT	S PLU	BEDE		JOINTS	EAN	TY	PE IN YPE	FAU ORII	LTS ENT DIS SIVES ELATIO
STRUC GEO	TURAL LOGY FOLDS ORIENT	PLL	RA	SKETCI	D. TAKE	EAN	TY		TRU TRU	LTS ENT DIS SIVES ELATIO
STRUC GEO	TURAL LOGY FOLDS ORIENT	PLU	RA	SKETCI		EAN	TY		TRU AL	LTS ENT DIS SIVES ELATIO
STRUC GEOI TYPE	TURAL LOGY FOLDS ORIENT	PLU	BEDE RA	SKETCI	JOINTS	EAN	T	IN YPE	TRU ORII	LTS ENT DIS SIVES ELATIO
		PLL	BEDC RA INGE ROP		JOINTS	EAN	TV	IN YPE	TRU ORII	LTS ENT DI SIVES ELATIO
STRUC GEOI TYPE	TURAL LOGY FOLDS ORIENT	PLU	RA RA ROP		JOINTS	EAN	TVI	IN	TRU TRU	LTS ENT DIS SIVES ELATIO
STRUC GEOI TVPE	TURAL LOGY FOLDS ORIENT	PLL PLL ang	RA RA ROP	SKETC	- TAKE M JOINTS	EAN	TV		TRU ORII	LTS ENT DIS SIVES ELATIO
STRUC GEOI TVPE		s PLL	ROP	SKETC	JOINTS	EAN	T	IN YPE	TRU R	LTS ENT DIS SIVES ELATIO
STRUC GEOI TYPE		s PLL	ROP :	SKETC	JOINTS	EAN	TV T			
	TURAL LOGY FOLDS ORIENT	PLL	RAP NGE	SKETC	D. TAKE	EAN	TVI T			LTS ENT DIS SIVES ELATIO
		PLL	RA RA ROP		D. TAKE	EAN	TV	IN	TRU ORI	LTS ENT DIS SIVES ELATIO
STRUC GEO	TURAL LOGY FOLDS ORIENT	Pice Pice	ROP ROP	SKETCH			TV	IN YPE	TRU R	LTS ENT DIS SIVES ELATIO

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				GEOL	OGY					
	LITH.	co	LOR	THICK	COMP.	GRAIN	R	s	FOS	FEAT
I	e I	1046	7/4	3 m	Jol	Vor	r	P	-	-
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	10551	bly.	Ple	istoce	ne					
UNIT	LITH	. [	COL	OR	COAL	CK	AL	D	ESC	RIPTI
COAL		-							1	
	LITH.	ço	LOF	THICK	COMP	GRAIN	R	5	FOS	FEA
	LITH,	ço	BEDD	THICK	COMP	GRAIN	N R	S	FAU	FEA
	LITH, NTS: TURAL	CO W	BEDD	THICK	COMP.	GRAIN SIZE	TY	PE	FAU	SE FEAT
UNIT 3 COMMEN STRUCT GEOL	LITH. NTS: TURAL OGY FOLD	CO W	BEDD	THICK	COMP.	GRAIN SIZE	TY	PE	FAU	LTS ENT SIVES
UNIT 3 COMMEN STRUCT GEOL TYPE	LITH. NTS: TURAL .OGY FOLD ORIENT	CO W			COMP	GRAIN SIZE N EAN	TY	S PE IN VPE	FAU ORII	LTS ENT I SIVE
UNIT 3 COMMEN STRUCT GEOL	LITH. NTS: TURAL OGY FOLD ORIENT	S PLL	BEDD RAT	THICK	. TAKE	GRAIN SIZE N EAN	V R TY	S PE IN YPE	FAU ORII	LTS ENT I SIVES
UNIT 3 COMME/ STRUCT GEOL TYPE	LITH. NTS: TURAL OGY FOLD ORIENT	CO W	BEDD RAT	THICK	COMP.	GRAIN SIZE N EAN	TTY	S PE IN VPE	FAU ORII TRU R	LTS ENT I SIVE
UNIT 3 COMME/ GEOL TYPE	LITH. NTS: TURAL OGY FOLD ORIENT	S PLL	BEDD RAT	THICK		GRAIN SIZE N EAN	TY		FAU ORII	LTS ENT C SIVES
UNIT 3 COMMEN STRUCT GEOL	LITH. NTS: TURAL OGY FOLD ORIENT	CO W		THICK	. TAKE	GRAIN SIZE N EAN	I R	IN YPE	FAU ORII	LTS ENT I SIVES
UNIT 3 COMME/ STRUCT GEOL	LITH, NTS: TURAL OGY ORIENT	S PLUTCI		THICK	TAKE JOINTS	GRAID SIZE	TY	S IN YPE	FAU ORII	LTS ENT C
UNIT 3 COMME/ STRUCT GEOL TYPE	LITH. NTS: TURAL OGY FOLD ORIENT	CO W	BEDD RAT	THICK	COMP.		TTY	PE IN VPE	FAU ORII TRU	SI FEA
UNIT 3 COMME/ GEOL TYPE	LITH. NTS: OGY FOLD ORIENT	S UTCI		THICK		GRAIN SIZE N EAN	T Y	S IN YPE	FAU ORII	ELTS ENT I SIVES
	LITH, NTS: TURAL OGY FOLD ORIENT	S PLU		THICK	TAKE MI	GRAIN SIZE	TY	IN YPE	FAU ORII	LTS ENT I SIVEELAT
	LITH. NTS: TURAL OGY FOLD ORIENT	S T PLL			COMP.	GRAIN	TY	PE IN VPE	FAU ORII	LTS ENT I SIVES
	LITH. NTS: TURAL OGY FOLD ORIENT	S PLU		ING NO			TY	IN YPE	FAU ORII TRU	SIVES
UNIT 3 COMME/ GEOL TYPE	LITH. NTS: OGY FOLD ORIENT	S PLU		THICK		GRAIN SIZE N EAN	T Y		FAU ORII TRU	SIVES

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				GEO	LOG	Y					1
	LITH.	COL	OR	THICK	cor	мΡ.	GRAIN	4 R	5	FOS	SED.
UNIT	SET	12	NZ	Im	Im	5T	M	. *		-	-
COMME	NTS:	9/9	1.4 6-		F. 6.	1	msT	-	-		-
e o mine	w	ELL	1	neers	#:0	240	10.31				
UNIT	LITH	. [	COL	OR	coal	THI	CK	AL	D	ESC	RIPTION
COAL		-	w	-	COAL	-	IIV I LON Y	-	-		
ZONE				-		-		-			
UNIT	LITH.	çoi	LOP	THIC	к со	MP.	GRAI	R	5	FOS	FEATU
	LITH.	COI W	LOF	THIC	K CO	MP.	GRAI	R	5	FOS	SED.
UNIT 3 COMMI	LITH.	N5	N 3	тнісі / m	к со 5%/	MP.	GRAI SIZE	N R -	5	Fos	SED. FEATU
UNIT 3 COMMI	LITH. SED ENTS:	5 N5	N 3	THICE /m	к со 5111 У С	MP. OLÉ RE	GRAI SIZE VFL	N R	5	FOS	SED. FEATU
	LITH. SED ENTS:	N5	N 3	THICH	к со 510 - у С	MP.	GRAII SIZE VFL	N R	5 -	FAU ORI	SED. FEATU
	LITH.	N5 N5	N 3	THIC	к со 510 -у С	MP.	GRAI SIZE VFL	N R - -	5 -	FAU ORI	LTS
	LITH. SED ENTS: CTURAL LOGY	N5 N5	N 3	THICH	K CO 511 	MP. 015 RE ME	GRAII SIZE VFL	TY		FAU ORID	LTS ENT DIS
UNIT 3 COMME STRUC GEO	LITH. SED ENTS: CTURAL LOGY FOLD ORIENT	N5 807+1	N 3	THICH	× co 5%	MP. 015	GRAII SIZE VFL	N R - TY	PE	FAU ORII TRU	LTS ENT DIS SIVES
UNIT 3 COMMI STRUC GEO	LITH. SED ENTS: CTURAL LOGY FOLD ORIENT	NS NS PLU	NGE	THIC	к со 5% -у С о. та 	MP.	GRAI SIZE VFL	TY	5 PE IN YPE	FAU ORIU TRU	LTS ENT DIS SIVES ELATIO
UNIT 3 COMMI STRUC GEO TYPE	LITH. SED ENTS: ETURAL LOGY FOLD ORIENT	NS NS PLU	NGE	THIC		MP. 065 KEI ME TS.	GRAI SIZE VFL	TY	S IN YPE	FAU ORI	LTS ENT DIS SIVES ELATIO
UNIT 3 COMMI STRUC GEO TYPE	LITH. SED ENTS: ETURAL LOGY FOLD ORIENT	NS NS PLU	NGE	THIC	к со 5% -у С - та 	MP.	GRAI SIZE VFL	TTY	S PE IN YPE	FAU PAU R	LTS ENT DIS SIVES ELATIO
UNIT 3 COMMI STRUC GEO TYPE	LITH. SED CTURAL LOGY FOLD ORIENT	NS NS RATHI PLU	NGE	THICH		MP.	GRAII SIZE VFL	TY	IN YPE	FAU ORI	LTS ENT DIS SIVES ELATIO
UNIT 3 COMMI STRUC GEO	LITH. SED TURAL LOGY FOLD ORIENT	S PLU	NGE	THICI		MP.	GRAII SIZE VFL	TV		FAU ORIU TRU	ETS ELTS ELTS ELTS ELATIO
UNIT 3 COMMI STRUC GEO	LITH.	SoT+1 SoT+1 UTCR	N 3 RAN RAN	THICH		MP.	GRAII SIZE VFL	<u>Ч</u> R 	S PE IN YPE	FAU FAU ORI	ENT DIS
UNIT 3 COMMI STRUC GEO	LITH.	NS NS PLU UTCR	NGE	THICH		MP. RE ME TS	GRAII SIZE VFL	TTY	S PE IN YPE	FAU PAU R	EIATIO
UNIT 3 COMMI STRUC GEO	LITH.	CON NS SOTAL	NGR ROP S	THICH	x co 5%	MP.	GRAII SIZE VFL	TY		FAU ORII	SED. FEATU Attack
UNIT 3 COMMI STRUC GEO	LITH. SED CTURAL LOGY FOLD ORIENT	CONSTRICT	N 3 P	THICH	x co 5%	MP.	GRAII SIZE VFL	TY	S PE IN YPE	FAU ORIU R	SED. FEATU Attack
UNIT 3 COMMI STRUC GEO TYPE		CONSTRICT	N 3 PRAN	THICH	x co 5%	MP.	GRAII SIZE VFL	TV	S PPE IN YPE	FAU ORI	SED. FEATU
UNIT 3 COMMI STRUC GEO	LITH. SED INTS: LOGY FOLD ORIENT	N5 N5 PLU UTCR	BEDD NAK	THICH	x co 500 4 C 0. TA JOIN H	MP.		TY		FAU ORI	SED. FEATUR
UNIT 3 COMMI STRUC GEO TYPE	LITH. SED INTS: FOLD ORIENT O	N5 N5 PLU UTCR		THICH		MP.	GRAII SIZE VFL	TY		FAU ORI	SED. FEATURE ENT DIS SIVES ELATIO
UNIT 3 COMMI STRUC GEO TYPE	LITH. SED INTS: LOGY FOLD ORIENT O	N5 N5 PLU UTCR		THICH		MP.		TY	S PE IN YPE	FAU FAU R	SED. FEATURE

30 RECONNAISSANCE OUTCROP DESCRIPTION FORM 7685 #2/05 BLIDE /PHOTO ROP GEOLOGIST ou DATE 0047 K, BERG JUNEIGR SAMPLE(S) 12 AERIAL PHOTO MAP ROONT-SST 92 ELEVATION LATITUDE A.1 LONGITUDE 200 7600 647300 GEOLOGY SED GRAIN COLOR THICK FOS COMP. n s LITH. FEATURES SIZE UNIT Ŵ GMC2. P <1m 0 1 578 UNC SFI COMMENTS: 10015 LIKE FO. THICK DESCRIPTION COLOR UNIT LITH. INTERVAL COAL w -2 COAL ZONE COMMENTS: SED. GRAIN COMP 12 -FOS COLOB THICK LITH. SIZE FEATURES UNIT 3 55 610 r1 SED COMMENTS: BEDDING NO. TAKEN FAULTS TYPE ORIENT DISP. STRUCTURAL MEAN RANGE GEOLOGY INTRUSIVES FOLDS JOINTS TYPE RELATION PLUNGE TYPE ORIENT COAL DETAIL OUTCROP SKETCH SED 055/80N

RECONNAISSANCE 30 OUTCROP DESCRIPTION FORM 7685 #2/05 SLIDE /PHOTO ROF GEOLOGIST DATE R GKZ 16/259 201 LIAS 1 SAMPLE(S) PHOTO AERIAL MAP Only 921 ELEVATION LATITUDE A LONGITUDE to 31001 5643150 78 64 50 GEOLOGY SED. GRAIN COLOR FOS COMP. -\* THICK LITH. FEATURES SIZE UNIT ŝ . Pr And SDR M x SED 4 Nom me -Bede COMMENTS: TO - ie Rebble DNG + OFFICENUL MUTIONS Att 53 1561 THICK COLOR DESCRIPTION UNIT LITH. COAL |INTERVAL ŵ \* COAL 59 ZONE COMMENTS: Ecourem pive of ) EDCALE LIKE SED. GRAIN R FOS s COLOR THICK COMP. LITH. FEATURES SIZE UNIT 3 COMMENTS: TAKEN TYPE ORIENT DISP NO. BEDDING STRUCTURAL MEAN RANGE GEOLOGY INTRUSIVES FOLDS JOINT5 TYPE RELATION TYPE ORIENT PLUNGE COAL DETAIL OUTCROP SKETCH RB-PILT - ROLL 3 6.2 Km organic Bed. fr. 2



JUNE 15/12  R.BERGA  ROUHH    MAP  AERIAL PHOTO  SAMPLE(S)  WM    921/10  ROUHH  ROUHH  SAMPLE(S)  WM    10  ROUHH  ROUHH  SAMPLE(S)  WM    10  ROUHH  ROUHH  SAMPLE(S)  WM    10  ROUHH  ROUHH  ROUHH  SAMPLE(S)  WM    10  ROUHH  SGEOLOGY  ELEVATION  SGEOLOGY    11  SED  SAMPLE  SM  SGEOLOGY    11  SED  SAMPLE  SM  SAMPLE    10  SED  SAMPLE  SIZE  R  SFOS    11  SED  SAMPLE  SM  SAMPLE  SED    11  SED  SAMPLE  SM  SAMPLE  SED    11  SED  SAMPLE  SM  SAMPLE  SED    12  LITH.  W  F  COAL  INTERVAL  DESCRIPTION    12  LITH.  W  F  COAL  INTERVAL  DESCRIPTION    20AL  ZONE  COAL  INTERVAL  DESCRIPTION    20AL  STRUCTURAL  BEDDING NO. TAKEN  TYPE ORIENT DI    3  STRUCTURAL  BEDDING NO. TAKEN  <	7685 #2/05		GEOLOG	IST	OUT	CROP			SL	DE/PH
MAP  AERIAL PHOTO  SAMPLE(S)  WWW    92 I  10  AERIAL PHOTO  ROD 444-554    LONGITUDE E  673150  5623500  1900    GEOLOGY    UNIT  LITH. WOR THICK COMP. GRAIN R S FOS FEATUR    1  520  5423500  1900    GEOLOGY    UNIT  LITH. WOR THICK COMP. GRAIN R S FOS FEATUR    1  520  544374  3744	Tur	- ick	p.	Brok	RO	2044	1			-
LONGITUDE E 673150 CATITUDE NJ 1900 GEOLOGY UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEATUR 1 SED 035 10 311 3m 0402 Var H P COMMENTS: CF5 C.55 TO BOURT TRANGUILLE BEDS 7 UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEATUR COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEATUR COMMENTS: UNIT LITH. W P THICK COMP. GRAIN R S FOS FEATUR COMMENTS: UNIT LITH. BEDDING NO. TAKEN TYPE ORIENT DI GEOLOGY RANGE MEAN TYPE ORIENT DI TYPE ORIENT PLUNGE JOINTS INTRUSIVES TYPE ORIENT PLUNGE JOINTS THERE COAL DETAIL	MAP 92I	110	AERIAL	РНОТО	SAM	PLE(S)	4	1.	WH 53	r. t
GEOLOGY    UNIT  LITH.  COLOR  SED    1  520  534  344  374	LONGITU	HOEE (	073150	562	0E NJ 2350	00			ELE T	900
UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEATUR 1 SED 035 3 3 3 3 0 00 C Var A A COMMENTS: G5 C S TO BOUNDAR TRANSMILLE BEDS 7. UNIT LITH. COLOR THICK DESCRIPTION COAL INTERVAL DESCRIPTION COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEATUR COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEATUR COMMENTS: STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT DI GEOLOGY HEAN TYPE ORIENT DI TYPE ORIENT PLUNGE JOINTS INTRUSIVES TYPE ORIENT PLUNGE JOINTS INTRUSIVES TYPE RELATION			-	GEO	LOGY					
UNIT 1 SED 035 1 3 1 3 0 0162 Var 1 1 COMMENTS: G5 C.S TO BOURT TRANGUILLE BEDS 7 UNIT LITH. COLOR THICK COAL INTERVAL DESCRIPTION 2 COAL 2010 COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED COMMENTS: UNIT LITH. W F COLOR THICK COMP. GRAIN R S FOS SED COMMENTS: STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT DI GEOLOGY RANGE MEAN TYPE ORIENT DI TYPE ORIENT PLUNGE JOINTS INTRUSIVES TYPE ORIENT PLUNGE JOINTS THE RELATION		LITH.	COLOR	THICK	COMP.	GRAIN	R	5	FOS	SED
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TRANGUILLE BEDS 7.    UNIT  LITH.  COLOR  THICK  DESCRIPTION    ZONE  ZONE  ZONE  ZONE  ZONE    COMMENTS:  THICK  COMP.  GRAIN R  S FOS    UNIT  LITH.  COLOR  THICK  COMP.  SIZE  R  S FOS    UNIT  LITH.  COLOR  THICK  COMP.  GRAIN R  S FOS  SED    COMMENTS:  COMMENTS:  STRUCTURAL  BEDDING NO. TAKEN  TYPE ORIENT DI    GEOLOGY  RANGE  MEAN  TYPE ORIENT DI    TYPE  FOLDS  JOINTS  INTRUSIVES    TYPE  ORIENT  PLUNGE  JOINTS  TYPE RELATION	COMMEN	TS: Ge	5 C.55	TO BO	JURIL,		-	-	-	-
UNIT LITH. COLOR THICK COAL INTERVAL DESCRIPTION COAL ZONE COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED COMMENTS: UNIT LITH. COLOR THICK COMP. SIZE R S FOS FEATU 3 BEDDING NO. TAKEN COMMENTS: STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT DI GEOLOGY FOLDS INTE INTRUSIVES TYPE ORIENT PLUNGE JOINTS INTRUSIVES TYPE ORIENT PLUNGE COAL DETAIL		TRAN	IQUIL	LED	EDS	7.				
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UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEATU 3 COMMENTS: STRUCTURAL BEDDING NO. TAKEN FAULTS GEOLOGY FOLDS TYPE ORIENT DI GEOLOGY INTE TYPE ORIENT DI TYPE ORIENT PLUNGE JOINTS TYPE RELATION TYPE ORIENT PLUNGE COAL DETAIL	COAL									
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TYPE ORIENT PLUNGE JOINTS INTRUSIVES	UNIT 3 COMME	LITH.	COLOP W	THIC	COMP.	GRAI	R	S	FOS	SED FEATU
DUTCROP SKETCH COAL DETAIL		LITH. NTS: TURAL	BED	DING NG	COMP.	GRAIT SIZE	TY	PE	FAU	SED FEATU
	UNIT 3 COMME STRUC GEOL	LITH. NTS: TURAL OGY FOLD: ORIENT	COLOF W P BED RI S PLUNGE	DING NG	COMP.	GRAIT SIZE	TY	PE IN YPE	FAU	LTS FEATU
	UNIT 3 COMME STRUC GEOL TVPE AU	LITH. NTS: TURAL OGY POLD: ORIENT	BED RI PLUNGE UTCROP	DING NG ANGE	COMP.	GRAIT SIZE	TY T	S PE IN YPE	FAU ORII	LTS ENT DIS SIVES ELATIO
UN T		LITH. NTS: TURAL OGY FOLD: ORIENT	BED RI PLUNGE UTCROP	SKETC	COMP.	GRAIT SIZE	TY	S PPE IN YPE	FAU ORII	LTS ENT DIS SIVES ELATIO
CONSIGN =		LITH. NTS: TURAL OGY FOLD: ORIENT	BED RI PLUNGE UTCROP	DING NG ANGE	COMP.	GRAID SIZE	TY	PE IN YPE	FAU ORII	LTS ENT DI SIVES ELATIO
CONSEL 010/1000		LITH. NTS: TURAL OGY FOLD ORIENT	BED RI PLUNGE UTCROP CONGL	DING NO		GRAID SIZE	TY	PE IN YPE	FAU ORII	SED FEATU
CONVERCE STRATE MU		LITH. NTS: TURAL OGY FOLD: ORIENT	BED RI PLUNGE UTCROP CONGL		COMP.	GRAID SIZE	TY	PE IN YPE	FAU ORII	SED FEATU
WH CONNOL 010/10000 WE 596/1 mU		LITH. NTS: TURAL OGY POLD: ORIENT	BED RI PLUNGE VTCROP CONGL		COMP.	GRAID	TY	IN YPE	FAU ORII	LTS FEATU
UN CONMUL WIE 596/1 MU VERY UN CONSOL.		LITH. NTS: TURAL OGY POLD: ORIENT	BED RI PLUNGE UTCROP CONGL /SOOW			GRAID SIZE	TY	PPE IN YPE		LTS ENT DIS SIVES ELATIO
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UN CONFIL ( 000/000 WERY UN CONSOL. - PLEIST? BUT WITH NEW VERT		LITH. NTS: TURAL OGY FOLD: ORIENT C. O ORIENT C. O C. O	CONGL PLUNGE PLUNGE PLUNGE CONGL /SDOW /I UN CU PLEIST M ALS	MU DING NO ANGE SKETCH		GRAID SIZE	TY	S IN YPE	FAU ORII	SEC FEATU

JUNE 14/12  ROHAG    MAP  AERIAL PHOTO  SAMPLE(S)    923  IS  Rood 6P.m.    LONGHTUDE E  LATITUDE AJ  ELEVAT    648 280  S644950  263    GEOLOGY    UNIT  LITH.    1  320  S644950  263    GEOLOGY    UNIT    1  320  S644950  263    COLOR THICK COMP. GRAIN R S FOS FEA    COMMENTS:    UNIT    UNIT    LITH.    COLOR    THICK COMP. GRAIN R S FOS FEA    COMMENTS:    UNIT    LITH.    COLOR    THICK COMP. GRAIN R S FOS FEA    COMMENTS:    UNIT    LITH.    COLOR    THICK COMP. GRAIN R S FOS FEA    COMMENTS:    UNIT    LITH.    COLOR    THICK COMP. GRAIN R S FOS FEA    COMMENTS:    STRUCTURAL    BEDDING NO. TAKEN <th>DATE</th> <th></th> <th>GEOLOGI</th> <th>ST</th> <th>OUT</th> <th>CROP</th> <th>5</th> <th>-</th> <th>SL</th> <th>IDE/F</th>	DATE		GEOLOGI	ST	OUT	CROP	5	-	SL	IDE/F
MAP  AERIAL PHOTO  SAMPLE(S)    1  AERIAL PHOTO  SAMPLE(S)    LONGHTUDE  LATITUDE  N    648380  S644950  265    GEOLOGY    UNIT  LITH.    VINIT  LITH.  COLOR    T  SED  SK    VINIT  LITH.  COLOR    VINIT  LITH.  COLOR    COMMENTS:  W F  COAL    UNIT  LITH.  COLOR    COAL  INTERVAL  DESCRIPT    COAL  COLOR  THICK    COAL  INTERVAL  DESCRIPT    COMMENTS:  STRUCTURAL  BEDDING NO.  TAKEN    TYPE  ORIENT  PLUNGE  JOINTS  INTRUSIVE    TYPE  ORIENT  PLUNGE  JOINTS  INTRUSIVE    OUTCROP SKETCH  COAL  COAL  DET	TUKIF	= 16/82	RB	P6	K	004	6			-
923/15  Roog67-min    LONGHTUDE E  LATITUDE AJ  ELEVAT    648280  5644950  263    GEOLOGY    UNIT  LITH.  COLOR    COLOR  THICK  COMP.    GEOLORY    STRUCTURAL  BEDDING NO. TAKEN    TYPE	MAP	1 10/00	AERIAL	PHOTO	SAM	PLE(S)	1	.1	12	2
LONGHTUDE E LATITUDE AJ ELEVAT 648 380 S644950 203 GEOLOGY UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEA COMMENTS: WF 105 6/6 CRET OR EO 7 UNIT LITH. COLOR THICK DESCRIPT COAL 20NE COLOR THICK COMP. GRAIN R S FOS FEA COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEA COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEA COMMENTS: STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT GEOLOGY AND COMPANIES INTRUSIVE TYPE FOLDS JOINTS TINTERUSIVE TYPE FOLDS JOINTS TINTERUSIVE OUTCROP SKETCH COAL DET	92	I/15	-	-		RO	05	16	1	me
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GEOLOGY    UNIT  LITH.  COLOR  THICK COMP. GRAIN R S FOS FER    COMMENTS:    UNIT  LITH.  COLOR    UNIT  LITH.  COLOR    UNIT  LITH.  COLOR    UNIT  LITH.  COLOR    UNIT  COLOR    UNIT  LITH.  COLOR    INTERVAL  COMMENTS:    STRUCTURAL  BEDDING NO. TAKEN  TYPE ORIENT    JOINTS  INTRUSIVE    TYPE  OUTCROP SKETCH    OUTCROP SKETCH	648	23.80	X	56	449	50	_	_	2	61
UNIT I THICK COMP. GRAIN R S FOS FEI SIZE R S FOS FEI SIZE R S FOS FEI COMMENTS: UNIT LITH. COLOR COAL INTERVAL DESCRIPT COAL ZONE COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEI COAL ZONE COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEI COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEI COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEI COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEI COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEI COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEI COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEI COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEI COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEI COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEI COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEI COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEI COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEI COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEI COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEI COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEI COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEI COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEI COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS FEI COMMENTS: CO				GEOI	LOGY					
I  JED  SUR  KIM  ONGL  VHE  P    COMMENTS:  WFT0EGGG  WFT0EGGG  THICK  DESCRIPT    UNIT  LITH.  WOF  COAL  INTERVAL  DESCRIPT    COAL  ZONE  INTERVAL  DESCRIPT    COAL  COAL  INTERVAL  DESCRIPT    COAL  COAL  INTERVAL  DESCRIPT    COAL  COAL  INTERVAL  DESCRIPT    COMMENTS:  COMMENTS:  STRUCTURAL  BEDDING NO. TAKEN  TYPE    STRUCTURAL  BEDDING NO. TAKEN  TYPE  PAULTS    STRUCTURAL  BEDDING NO. TAKEN  TYPE  PAULTS    TYPE  FOLDS  JOINTS  INTRUSIVITY    TYPE  FOLDS  JOINTS  INTRUSIVITY    OUTCROP SKETCH  COAL  COAL  DET	UNIT	LITH.	COLOR	THICK	COMP.	GRAIN	R	s	FOS	FEA
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CRET OR EO  COLOR  THICK  DESCRIPT    COAL  LITH.  W  P  COAL  INTERVAL  DESCRIPT    COAL  ZONE	COMMEN	NTS:	10 w	= 10 # G	16			1		
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OUTCROP SKETCH	UNIT 3 COMME	LITH.	COLOB	THICK	COMP.	GRAIN	N R	S	Fau	FEA
OUTCROP SKETCH COAL DET		LITH. NTS: TURAL	BEDD	THICK	. TAKE	GRAIN	TY	PE	FAU	FEA
OUTCROP SKETCH COAL DET	UNIT 3 COMME STRUC GEOL	LITH. NTS: TURAL OGY FOLD:	BEDD RAT FLUNGE	THICK	COMP.	GRAIN SIZE	TY	PE	FAU ORII TRU R	LTS ENT SIVE
	UNIT 3 COMME STRUC GEOL TYPE	LITH. NTS: TURAL .OGY FOLD: ORIENT	COLOR W F BEDE RAT 5 PLUNGE	THICK	. TAKE	GRAIN SIZE	TY	PE	FAU ORII TRU R	LTS ENT SIVE
		LITH. NTS: TURAL OGY FOLD: ORIENT	BEDD RAT PLUNGE	THICK	. TAKE	GRAIN SIZE	TY TY	PE	PAU ORII	
		LITH. NTS: TURAL OGY FOLD: ORIENT	BEDD RAT PLUNGE	THICK	COMP.	GRAIN	TTY	PE IN YPE	FAU ORII TRU	LTS ENT SIVE
		LITH. NTS: TURAL OGY FOLD: ORIENT	BEDD RAT PLUNGE	THICK	COMP.	GRAIN	TY	PE IN YPE	FAU ORIT	SIVE ENT SIVE ELAT
	UNIT 3 COMME STRUC GEOL	LITH. NTS: TURAL OGY FOLD: ORIENT	BEDD RAT PLUNGE	THICK	COMP.		TT	PE IN YPE	FAU ORII TRU	SIVE ENT SIVE
	UNIT 3 COMME STRUC GEOL TYPE	LITH. NTS: OGY FOLD: ORIENT	BEDD RAT PLUNGE	THICK	COMP.		TT	PE IN YPE		LTS ENT SIVEELA
		LITH. NTS: OGY FOLD: ORIENT	BEDD RAT PLUNGE	THICK	COMP.	GRAIN SIZE	TY	PE IN YPE	PAU ORII	LTS ENT SIVE ELA

DATE GEOLOGIST DUTCROP SLIDE THE JUNE II 2 RBEEG ROO39 MAP AERIAL PHOTO SAMPLE(S) BO039 P LONGITUDE F C53250 LATITUDE N GEOLOGY UNIT LITH. COLOR THICK COMP. GRAIN R S POS SED. 1 SED NS NZ 1.5 m SILEST VFL COMMENTS: VERY SMALL U/C. THE COLOR THICK COAL INTERVAL DESCRIPTION COAL INTERVAL DESCRIPTION COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED. UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED. COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SED. COMMENTS: UNIT LITH. BEDDING NO. TAKEN TYPE ORIENT DIS STRUCTURAL BEDDING NO. TAKEN TYPE ORIENT DIS TYPE ORIENT PLUNGE JOINTS TYPE RELATION OUTCROP SKETCH COAL DETAIL	DATE CECOLOGIST CUTCROP ROBINS ALDERMINE TUNE II & REVIAL PHOTO SAMPLE(S) RAP AERIAL PHOTO SAMPLE(S) EDUCITURE CLATITUDE N C53250 LATITUDE N C53250 LATITUDE N C53250 SEC. COMMENTS: VIEW P THICK COMP. GRAIN R S POS SEC. UNIT LITH. COLOR THICK COMP. SIZE R S POS PEATURE COMMENTS: VIEW SMALL O/C. TO SO UNIT LITH. COLOR COAL INTERVAL DESCRIPTION COAL INTERVAL DESCRIPTION COAL INTERVAL DESCRIPTION COAL COAL INTERVAL DESCRIPTION COMMENTS: UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SEC. UNIT LITH. COLOR THICK COMP. GRAIN R S FOS SEC. UNIT LITH. COLOR THICK COMP. SIZE S SEC. UNIT S SEC. UNIT LITH. COLOR THICK COMP. SIZE S SEC. UNIT LITH. COLOR THICK COMP. SIZE S SEC. UNIT S SEC. UNIT LITH. COLOR THICK COMP. SIZE S SEC. UNIT S SEC. UNIT S SEC. UNIT LITH. COLOR SKETCH S SEC. OUTCROP SKETCH COAL DETAIL		5 (	DUTC	CROP	DESC	RIPTIC	ON FO	ORI	M	1	-
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RECONNAISSANCE 27.0 OUTCROP DESCRIPTION FORM 7685 \$2/05 ROF SLIDE/PHOTO DATE GEOLOGIST R0040 JUNE / P BERG SAMPLE(S) AERIAL PHOTO MAP 55 T 92 I/10 R0040 PALEO ELEVATION L'ATITUDE A LONOTTUDE P 48251 5616800 653850 GEOLOGY SED COLOR GRAIN COMP. FOS THICK n 10 LITH. EATURES SIZE UNIT w 16 mU 5C 1 NG Im SED 115 557 UP FORDIN, ZEM - CONSE COMMENTS: SURDER MUMULAR CLASS with INNTRIX OF 437 COLOR THICK UNIT DESCRIPTION LITH. COAL LINTERVAL ×. 2 w COAL ZONE COMMENTS CONGLOMERATE THAS CAP VOLC UNDERLYING 2 Kington to GRAIN R SED. COLOR COMP. s FOS THICK LITH. FEATURES UNIT 1 COMMENTS! BEDDING NO. TAKEN FAULTS TYPE ORIENT DISP. STRUCTURAL MEAN RANGE GEOLOGY INTRUSIVES FOLDS JOINTS TYPE RELATION PLUNGE TYPE ORIENT COAL DETAIL OUTCROP SKETCH foll 2 34-55+ 35 - CONTRACT

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DUTCROP SKETCH 12KM- C-NH MUCH LIKE AT TOP		LITH.	BE		THICK	COMP	GRAIN SIZE	TYI	S	FAU	SED. FEATURE	
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UNIT 3 COMME	LITH.	COLOP W	THICK	COMP.	GRAIN	R	s	Pos	FE
	LITH. NTS:	BEDI	THICK	COMP.	GRAIN SIZE	R	S	FAU	FE
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UNIT 3 COMME STRUC GEOI	LITH. NTS: TURAL LOGY FOLDS ORIENT	BEDI RA FLUNGE	THICK	COMP.	GRAIN SIZE	R TYP TŸ	S E IN	FAU	FE
UNIT 3 COMME STRUC GEOI 7VPE	LITH. NTS: TURAL OGY FOLDS ORIENT		THICK	. TAKET	GRAIN SIZE	R TYP TŸ	s IN PE	FAU ORIE R	
UNIT 3 COMME STRUC GEOI 7VPE	LITH. NTS: TURAL OGY FOLDS ORIENT	BEDI RA PLUNGE	THICK	COMP.	GRAIN SIZE	R TYP TŶ	S IN IPE	FAU ORII	
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UNIT 3 COMME STRUC GEOI TYPE	LITH. NTS: TURAL OGY FOLDS ORIENT		THICK	JOINTS	GRAIN SIZE		S IN TPE	FAU ORIN	
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	LITH. NTS: TURAL	ço	BEDI	THI	CK NO.	TAKE	GRAIN SIZE	4 R TY	S PE	FAU	SED FEATU
UNIT 3 COMME STRUC GEOL	LITH. NTS: TURAL OGY FOLD:	CO W	BEDI	THI	ск NO.	TAKE ME	GRAIN SIZE	4 R TY	PE	FAU ORII	SED FEATU
UNIT 3 COMME STRUC GEOL	LITH. NTS: TURAL OGY FOLD: ORIENT	CO W			CK NO.	TAKE	GRAII SIZE	4 <i>R</i>	PE	FAU ORII	SED FEATU
UNIT 3 COMME STRUC GEOL TYPE	LITH. NTS: TURAL OGY FOLD: ORIENT			THI DING NGE	ск <u>1</u>		GRAII SIZE	TV	PE IN YPE	FAU ORII	SIVES
UNIT 3 COMME STRUC GEOL	LITH. NTS: TURAL OGY FOLD: ORIENT	S PLU			ск <u>ј</u>	TAKE ME OINTS	GRAIN SIZE	4 R TV	S PE IN YPE	FAU ORII	SIVES
UNIT 3 COMME STRUC GEOL TYPE	LITH. NTS: TURAL OGY FOLD: ORIENT	S PLU	BEDI	THI DING NGE	ск 		GRAII SIZE	4 n TV	S IN YPE	FAU ORII	SED. FEATURE
UNIT 3 COMME STRUC GEOL TYPE	LITH. NTS: TURAL OGY FOLD: ORIENT	CO W S PLU	BEDI		ск NO. 	TAKE ME	GRAIN SIZE	TY TY	PE IN YPE	FAU ORII TRU AL	SIVES ELATIO
UNIT 3 COMME STRUC GEOL TYPE	LITH. NTS: TURAL OGY FOLD: ORIENT	CO W			CH	TAKE	GRAII SIZE	TY	S PE IN YPE	FAU ORII	SIVES
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UNIT 3 COMME STRUC GEOL TYPE	LITH. NTS: TURAL OGY FOLD: ORIENT	S PLU		THI DING_ NGE	ск NO.		GRAIN SIZE	TY	PE IN YPE	FAU ORII	SIVES ELATIO
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	LITH. 35+ ENTS:	58	Inter a	тніс) 7 / м 52 .	COMP LITH	GRI	AIN R	5	Fos	PEAT	D.
	LITH. 35+ ENTS:	058	BEDD	THICH	COMP	GRI SIZ	AIN R 2 ///	S /	FAU	SE FEAT	
	LITH. 35+ ENTS: TURAL	058	BEDD RAL	THICH / / m FE	COMP		AIN R	PE	FAU	SE FEAT	0.5
UNIT 3 COMMI STRUC GEO TYPE	LITH. 35+ ENTS: CTURAL LOGY FOLD ORIENT	058	BEDD RAT	THIC)	COMP		TTY	PE IN YPE	FAU ORIN	LTS ENT I	
UNIT 3 COMMI STRUC GEO TYPE	LITH. SS+ ENTS: CTURAL LOGY FOLD ORIENT	058 PL	BEDD BEDD	THICH				S PE IN VPE	FAU ORII TRU R	LTS ENT C SIVES	DIS
UNIT 3 COMMI STRUC GEO TYPE	LITH. SS+ ENTS: CTURAL LOGY FOLD ORIENT	058	BEDD RAT	THICH			TTY	S PE IN Y PE	FAU ORIN	LTS ENT D SIVES	
UNIT 3 COMMI STRUC GEO TYPE	LIYH. 354 ENTS: TURAL LOGY FOLD ORIENT	058	BEDD RAT	THICH	COMP		TY	S IN VPE	FAU ORII	LTS ENT D SIVES	
UNIT 3 COMMI STRUC GEO TYPE	LITH. 35+ ENTS: CTURAL LOGY FOLD ORIENT	058	BEDD RAT	THICH	COMP			IN YPE	FAU ORII	SECONDETA	
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UNIT 3 COMMI STRUC GEO TYPE	LIYH. 354 ENTS: TURAL LOGY FOLD ORIENT	058	BEDD RAT	THICH	COMP	GR	TTY		FAU ORII TRU	SE PEAT	
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UNIT  LITH.  COLOR  THICK  COMP.  GRAIN    UNIT  LITH.  COLOR  THICK  COMP.  GRAIN  ELEVAT    GEOLOGY  GEOLOGY  GEOLOGY  ELEVAT  GEOLOGY    UNIT  LITH.  COLOR  THICK  COMP.  GRAIN  ELEVAT    1  COMMENTS:  GEOLOGY  ELEVAT  GEOLOGY    UNIT  LITH.  COLOR  THICK  COMP.  GRAIN    2  LITH.  COLOR  COMP.  GEAT    2  COMMENTS:  STRUCTURAL  COLOR  THICK  COMP.    3  SST  MAR.  MAR.  MAR.  MAR.    3  SST.  MAR.  MAR.  MAR.    2  COMMENTS:  MAR.  MAR.  MAR.    0  STRUCTURAL  BEDDING NO. TAKEN  TYPE ORIENT    3  STRUCTURAL  BEDDING NO. TAKEN  TYPE ORIENT    1  OUTCROP SKETCH  COAL DET.	7685 82/05	UL	GEOLOGI	ST	lou	TCRC	DP			SL	DE/P
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GEOLOGY    UNIT  LITH.  GRAIN R S FOS FEA    COMMENTS:    UNIT    LITH.  COLOR COLOR COMP. GRAIN R S FOS FEA    UNIT    LITH.  COLOR COLOR THICK    COMMENTS:    UNIT    LITH.  COLOR THICK COMP. GRAIN R S FOS FEA    COMMENTS:    UNIT  LITH.  COLOR THICK COMP. GRAIN R S FOS FEA    COMMENTS:    UNIT  LITH.  COMMENTS:    UNIT  COMMENTS:    UNIT  COMMENTS:    COMMENTS:    UNIT  COMMENTS:    OUTCROP SKETCH    OUTCROP SKETCH    OUTCROP SKETCH	C35	200	0	LATITU	DEN 20	45	-0	-		ELE 3	VATI
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13 May astim Lebus	UNIT 3 55° COMMENTS: STRUCTUR GEOLOGY TYPE ORI	AL Y DLDS	BEDD RAP	THICI	K COMI	E AN	ain ize	R	5 /// / / / / / / / //	FAU ORIE TRU	ELAT
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|-------------------------------------|---|-------------|---------------------|---------------|-------|---------------|----------|----------------------|-------------------------|----------------------------------|
| TUNE                                | 24/82   | GEG         | RB                  | E12(-)        | Re    | 005           | 6        | 6                    | F                       | 3                                |
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| - 1                                 | The Alactic                                       |             |                     | GEOI          | OGY   |               |          |                      |                         |                                  |
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| UNIT<br>3<br>COMME                  | LITH,   | ço          | LOP                 | THICK         | COMP. | GRAIN         | R        | s                    | Fos                     | SED                              |
|                                     | LITH.   | ço          | BEDD                | THICK         | COMP. | GRAIN<br>SIZE | R        | s                    | FOS                     | SED<br>FEATU                     |
| UNIT<br>3<br>COMME<br>STRUC<br>GEOI | LITH.<br>NTS:<br>TURAL                            | ço          | BEDD                | THICK         | COMP. | GRAIN<br>SIZE | N R      | PE                   | FAU                     | SED<br>FEATU                     |
| UNIT<br>3<br>COMME<br>STRUC<br>GEOI | LITH.<br>NTS:<br>TURAL<br>LOGY<br>FOLD            | CO<br>W     | BEDD                | THICK         | COMP. | GRAIN<br>SIZE | Y R      | PE                   | FAU                     | LTS<br>ENT DI                    |
| UNIT<br>3<br>COMME<br>STRUC<br>GEOI | LITH.<br>NTS:<br>TURAL<br>LOGY<br>FOLD<br>ORIENT  | CO<br>W     | BEDD                | THICK         | COMP. | GRAIN<br>SIZE | TY<br>TY | PE                   | FAU<br>ORII<br>TRU<br>R | ENT DI                           |
| UNIT<br>3<br>COMME<br>STRUC<br>GEOI | LITH.<br>NTS:<br>TURAL<br>LOGY<br>FOLD<br>ORIENT  | S PLU       | BEDD<br>RAN         | THICK         | COMP. | GRAIN<br>SIZE | TTY      | S<br>PE<br>IN<br>YPE | FAU<br>ORII             | LTS<br>ENT DI<br>SIVES<br>ELATIO |
| UNIT<br>3<br>COMME<br>STRUC<br>GEOI | LITH.<br>NTS:<br>TURAL<br>LOGY<br>FOLD<br>ORIENT  | S<br>PLU    | BEDD<br>RAT         | THICK         | COMP. | GRAIN<br>SIZE | TY       | S<br>PE<br>IN<br>YPE | FAU<br>ORII             | SED<br>FEATU                     |
| UNIT<br>3<br>COMME<br>STRUC<br>GEOI | LITH.<br>NTS:<br>TURAL<br>LOGY<br>FOLD<br>ORIENT  | S PLU       | BEDD<br>RAN         |               | COMP. | GRAIN<br>SIZE | TTY      | S<br>PE<br>IN<br>YPE | FAU<br>ORII             | SED<br>FEATU                     |
| UNIT<br>3<br>COMME<br>STRUC<br>GEOI | LITH.<br>INTS:<br>TURAL<br>LOGY<br>FOLD<br>ORIENT | S PLU       |                     | THICK         | TAKE  | GRAIN<br>SIZE | TY       | S<br>PE<br>IN<br>YPE | FAU<br>ORII             | ELATU                            |
| UNIT<br>3<br>COMME<br>STRUC<br>GEOI | LITH.<br>TURAL<br>LOGY<br>FOLD<br>ORIENT          | S<br>PLUTC  | BEDD<br>RAN<br>JNGE | THICK         | COMP. | GRAIN<br>SIZE | TTY      | S<br>IN<br>YPE       | FAU<br>ORII             | SED<br>FEATU                     |
| UNIT<br>3<br>COMME<br>STRUC<br>GEOI | LITH.<br>NTS:<br>TURAL<br>LOGY<br>FOLD<br>ORIENT  | S<br>PLU    | BEDD<br>RAN<br>JNGE |               | COMP. | GRAIN<br>SIZE | TY       | PE<br>IN<br>YPE      | FAU<br>ORII             | LTS<br>ENT DI<br>SIVES<br>ELATIC |
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June 26     RBL rg     ROGS 8       MAP     AERIAL PHOTO     SAMPLE(S)       92.1/15     EATHYODE     NODS8 - P       LOROTTUDE     ELEVATION       665700     5525700       GEOLOGY       UNIT       LITH.     COLOR       T     ST       THICK COMP. GRAIN R 5 POS FEATUR       THICK COMP. GRAIN R 5 POS FEATUR       COMMENTS:       UNIT       LITH.     COLOR       THICK COMP. GRAIN R 5 POS FEATUR       COMMENTS:       UNIT       LITH.     COLOR       THICK COMP. GRAIN R 5 POS FEATUR       COAL LITH.       COAL DESCRIPTION       COAL DESCRIPTION       COAL DESCRIPTION       COAL DESCRIPTION       COAL DETAIL <td co<="" th=""><th>Jung 26     Bigg     R0658       MAP     AFRIAL PHOTO     SAMPLE(S)       92.1     IS     R0058-P       100000000     ELEVATION       665700     S525700       GEOLOGY       UNIT       LITH.     COLOR       THICK     COMP.       GEOLOGY       UNIT       LITH.     COLOR       THICK     COMP.       GRAIN     R       STRUCTURAL     BEDDING       NO. TAKEN       TYPE ORIENTS:</th><th>DATE</th><th></th><th>GEO</th><th>DLOGI</th><th>ST</th><th>OUT</th><th>CROP</th><th></th><th></th><th>SL</th><th>DE/FHC</th></td>	<th>Jung 26     Bigg     R0658       MAP     AFRIAL PHOTO     SAMPLE(S)       92.1     IS     R0058-P       100000000     ELEVATION       665700     S525700       GEOLOGY       UNIT       LITH.     COLOR       THICK     COMP.       GEOLOGY       UNIT       LITH.     COLOR       THICK     COMP.       GRAIN     R       STRUCTURAL     BEDDING       NO. TAKEN       TYPE ORIENTS:</th> <th>DATE</th> <th></th> <th>GEO</th> <th>DLOGI</th> <th>ST</th> <th>OUT</th> <th>CROP</th> <th></th> <th></th> <th>SL</th> <th>DE/FHC</th>	Jung 26     Bigg     R0658       MAP     AFRIAL PHOTO     SAMPLE(S)       92.1     IS     R0058-P       100000000     ELEVATION       665700     S525700       GEOLOGY       UNIT       LITH.     COLOR       THICK     COMP.       GEOLOGY       UNIT       LITH.     COLOR       THICK     COMP.       GRAIN     R       STRUCTURAL     BEDDING       NO. TAKEN       TYPE ORIENTS:	DATE		GEO	DLOGI	ST	OUT	CROP			SL	DE/FHC
MAP     AERIAL PHOTO     SAMPLE(S)       92.1/15     AERIAL PHOTO     SAMPLE(S)       LONOTTUDE     EATITUDE     NOTOTUDE       LONOTTUDE     ELEVATION       GEOLOGY       GEOLOGY       UNIT       LITH.     COLOR       THICK     COMP.       GRAIN     R       STRUCTURAL     COLOR       THICK COMP.       GRAIN     COAL       UNIT       LITH.     COLOR       THICK     COMP.       GRAIN       UNIT       LITH.     COLOR       THICK COMP.       GRAIN     DESCRIPTION       COAL       INTERVAL       OLOS <td< th=""><th>MAP     AFRIAL PHOTO     SAMPLE(S)     STATE       92.1     15     AFRIAL PHOTO     SAMPLE(S)     STATE       1070779982     1     COLOGY     ELEVATION       1070779982     1     SSOA       0665700     SSOA       GEOLOGY       UNIT       1     COLOGY       THICK COMP. GRAIN R S FOS PEATUR       COMMENTS:       UNIT       LITH.       COLOGY       UNIT       LITH.       COLOGR       THICK COMP. GRAIN R S FOS PEATUR       COMMENTS:       UNIT       LITH.       COLOGR       THICK COMP. GRAIN R S FOS PEATUR       COLOGR       THICK COMP. GRAIN R S FOS PEATUR       COLDS       COMMENTS:</th><th>1.</th><th>26</th><th>1</th><th>2301</th><th>ra.</th><th>F</th><th>065</th><th>8</th><th></th><th></th><th>-</th></td<>	MAP     AFRIAL PHOTO     SAMPLE(S)     STATE       92.1     15     AFRIAL PHOTO     SAMPLE(S)     STATE       1070779982     1     COLOGY     ELEVATION       1070779982     1     SSOA       0665700     SSOA       GEOLOGY       UNIT       1     COLOGY       THICK COMP. GRAIN R S FOS PEATUR       COMMENTS:       UNIT       LITH.       COLOGY       UNIT       LITH.       COLOGR       THICK COMP. GRAIN R S FOS PEATUR       COMMENTS:       UNIT       LITH.       COLOGR       THICK COMP. GRAIN R S FOS PEATUR       COLOGR       THICK COMP. GRAIN R S FOS PEATUR       COLDS       COMMENTS:	1.	26	1	2301	ra.	F	065	8			-	
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