RB 545

D.M. 1881/54.

DEPARTMENT OF MINES.

SOUTH AUSTRALIA.

Report No. 1 on

RECONNAISSANCE SURVEY FOR LOCATION OF ALTERNATIVE QUARRY SITES BETWEEN HALLETTS COVE AND THE TORRENS RIVER.

by

L.G. Nixon,
Geologist.

ENGINEERING GEOLOGY & MINERAL RESOURCES SECTION

GEOLOGICAL SURVEY.

CONTENTS.

MAP REFERENCE.

No.	Title.	Scale.
57-86	Locality Plan of some Alternative Quarry Sites, Adelaide Hills area.	1 inch to 1 mile.

21st February, 1957.

G.S. Report No. 636.

H.O. Report No. 44/20.

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1. ABSTRACT.

Arkosic quartzites of Pre Cambrian age contained in the Torrensian, Sturtian and Marinoan series occur in the Adelaide Hills. The largest deposits are in the Torrension series, in which several alternative quarry sites have been located.

Adequate quantities of stone are available at these alternativesites to maintain quarrying operations for some years. Most of the areas mapped as Stonyfell Quartzites, however, are poor quality stone, unsuitable for use in civil engineering projects.

2. INTRODUCTION.

A reconnaissance survey for alternative quarry sites in the Adelaide hills was carried out on 18 days between 6th December, 1956 and 8th February, 1957. The survey was initiated because of requests from local governing bodies and others, for the location of alternative quarry sites out of sight of the city. Its purpose was to report on the suitability or otherwise of various deposits and localities between Hallett's Cove and the Torrens River, and for one mile easterly from the western edge of the Adelaide hills.

It is proposed to continue the survey north of the river at a later date.

Since the survey was of a reconnaissance nature only, there are many areas which were not investigated in detail. For instance, all the numerous gullys and spurs of Black Hill, Rocky Hill or Rockdale Hill could not be examined. But at least one traverse, and usually several, were carried out over the above-mentioned areas.

All reserves are based on visual estimates of heights, extensions etc. It must be pointed out here that reserves estimated visually could differ considerably from those worked out following a detailed instrument survey. However, the figures quoted will serve as a guide to those interested in any particular area and, in comparing deposits, will give some idea of the volume of stone available. It is thought that this would be of particular value to the small operator.

3. USES.

Quartzites. The main use for quartzite in the Adelaide area is in civil construction work, particularly in road building, railway ballast and for better quality stone as concrete aggregate.

Numerous other minor uses, not listed here, are found for this stone.

Limestone. While formerly used for the manufacture of cement, the two main uses of this stone today are as concrete aggregate and as bitumen aggregate for road construction purposes. Limestone is preferred to quartzite for bitumen aggregate because of greater adhesion between limestone and bitumen than between quartzite and bitumen.

Slates. In the early days, and at the turn of the century, this stone was used extensively for house building purposes. There is no great demand for this stone at the present time and no slate quarries were being operated within the area covered at the time of the survey.

The more weathered slates are used in the manufacture of cement provided the $MgCO_3$ content does not exceed 5% and the SiO_2 to $Fe_2O_3 + Al_2O_3$ ratio falls between 2.2 and 2.8. Tile and brick manufacturers are also using weathered slates with clay for their products.

4. GEOLOGY.

The quartzites, slates and limestones in the Adelaide hills between Marino and the Torrens River occur as sediments of Pre Cambrian age, contained in the Adelaide System and include the Torrensian, Sturtian and Marinoan Series. The whole area forms part of the Mt. Lofty anticlinorium structure. All the main fold structures south of the Torrens River have a southerly pitch.

Slates. This type of stone has been quarried in the Sturtian and Torrensian series in the area reconnoitred. None of the quarries examined were in production. The demand for the stone originally was for building purposes, and since this type of building stone is no longer in demand, the quarries have ceased operations.

Some slates with suitable chemical properties are used in cement manufacture.

Limestones. The only major deposits of this stone within the area investigated, occur as part of the Brighton Limestone formation in the Sturtian Series and are being quarried near Marino at the present time.

Quartzites. For the purposes of this investigation, this is the most important of the rock types. It occurs in the Torrensian, Sturtian and Marinoan Series, but is most important in the Torrensian, which contains the Stonyfell Quartzite Formation.

The quartzites in the Series mentioned above can be classified as orthoquartzites. This term is used to distinguish the rock from a quartzite of metamorphic origin designated a metaquartzite.

Almost without exception the beds are felspathic and could be better described as arkosic orthoquartzites.

In the following pages the terms "good quality quartzite" and "poor quality quartzite" are used. The good quality

quartzite is one whose cement is silica and which, on being struck with a hammer, will shatter to smaller angular fragments. This stone is tough, hard and dense.

The poor quality quartzite includes all those rocks which are made up of sand grains of silica but whose cementing material is either iron oxide, kaolin or both. The proportion of silica cement is variable but is usually small. This rock type, when struck with a hammer, usually powders to individual sand grains.

Possible Origin of the Quartzites.

Whilst no detailed laboratory investigations have yet been undertaken regarding the nature of the origin of the quartzites, the following hypotheses, based on field observations, are submitted to explain the presence of quartzites in areas where they occur.

Primary quartzites. These sediments are usually fine to medium grained but can be gritty; they are interbedded with sandy quartzites and freestones. The beds are dense, tough, light grey to creamy coloured and highly siliceous. It is thought that the high silica content was contemporaneous with sedimentation. They occur in the Torrensian, Sturtian and Marinoan series.

Soaked Quartzites. Silicification is thought to be due to soaking of these sediments by hydrothermal solutions along fault lines and in breccia zones. Silicification does not necessarily extend along the entire length of the fault or breccia zone. Where soaking is thought to have taken place, free quartz in the form of veinlets and reefs occur in the area sometimes carrying ore minerals. Secondary silicification from surface waters, leaching material from near the surface and precipitating it lower down along these fault planes is also thought to have taken place. Beds silicified along a fault zone may revert to a freestone away from it.

Structural control Quartzites. These quartzites are thought to be of secondary origin. In beds which have been folded, it is thought that silica cement has been leached from the limbs of the folds and concentrated in the keels. Secondary silicification along fault lines would also be placed under this heading. In the case of folds, the leached limbs would be rendered friable and of poor quality, whereas the keels would be of fairly good quality quartzite.

Secondary Quartzites. Secondary silicification of siliceous arenaceous beds, may occur, in which the secondary silica is in crystallographic continutiy with the quartz grains. This type of silicification is distinct from secondary silicification in which the silica is not in crystallographic continuity with the quartz grains, and is thought to be more resistant to weathering and leaching than the latter. It may occur in all the types of quartzites described above.

Quartzites in the Torrensian Series.

(a) The Stonyfell Quartzite Formation. This formation contains the most important deposits of quartzite in the Adelaide Hills. In these beds are located the largest operating quarries in the area investigated, including Rockdale, Stonyfell and Greenhill Quarries.

From traverses carried out across Rockdale Hill, Rocky Hill and Black Hill (three major occurrences of Stonyfell Quartzite) it was found that only a small percentage of the stone would be suitable for quarrying as quartzite. Most of the rock was found to be friable sandstone, in some places easily crumbled between the fingers. The cement in most places was a kaolinitic type. It was found that in the Stonyfell "Quartzites" in the hills named above, arkosic orthoquartzites of good quality made up between 10 to 30% of the total volume of rock.

The variation in quality of the siliceous arenaceous beds depends on the nature and proportions of the cementing materials. In the good quality quartzites the cement contains a

very high proportion of silica. The sandstones of varying degrees of toughness have a higher proportion of kaolin, iron oxide or both to silica, as cement.

(b) The quartzites in the upper and lower phyllite formations.

The arkosic orthoquartzites in these formations are usually white to greyish white, slightly arkosic, highly siliceous, tough and medium to fine grained (sometime grit size, Wentworth scale). The beds are of variable thickness up to about 100 feet. Being interbedded in incompetent sediments they are usually highly folded and in some areas, overturned. Near the competent massive deposits of the Stonyfell quartzites, however, the folding has been gentle as can be expected.

Quartzites in the Sturtian Series.

(a) The Belair slates and quartzites group. Quartzites in this group where seen, were of excellent quality. The rock is tough, dense, highly siliceous, slightly feldspathic and of variable colour from cream to light blue grey. In the Sleeps Hill area the beds have been folded and the folds overturned. No quarries are operating in this group at the present time in the area looked at.

5. ALTERNATIVE QUARRY SITES.

Several areas with reserves not less than one million cubic yards have been located. These occur in Sections 304, 305, 830, 997, 998; 1163, 1164, 1166; 1107, 1108, 1109; 1150, 1184; 1020; 1076 and 1077; Hundred of Adelaide, .. Section 334, Hundred of Onkaparinga and Sections 215, 248, 249; Hundred of Noarlunga. . It is apparent that these localities contain sufficiently large reserves to maintain quarrying operations for some years. All are close to markets. Details of these deposits are contained in Appendix Part I; see also localities 1 - 10 on plan 57-86 attached.

Other quarry sites whose potential reserves are estimated at between 100,000 cu. yds. and 1,000,000 cu. yds. are

contained in Appendix Part II. The areas contain reserves sufficient in size to interest small scale operators. See localities 1 - 13 on plan 57-86 attached.

Appendix Part III contains all quarry sites with potential reserves estimated to be less than 100,000 cu. yds.

These deposits would have a limited life but could be operated to supply special markets.

However, both in Part II and Part III there may be areas where several deposits could be worked by a single company for feeding one plant. The combined reserves in such cases could be quite large.

The fourth part, Appendix Part IV, includes all other potential deposits condemned because of various reasons, including nearby housing, subdivision of land for building purposes, in sight of the city, difficulties in working, etc.

6. CONCLUSIONS AND RECOMMENDATIONS.

Adequate reserves of quartzite for the development of alternative quarry sites exist in the Adelaide Hills. Although there are enormous volumes of siliceous arenaceous sediments only between 10% and 30% is of good quality. The remainder of the stone is usually too friable for use in civil engineering projects or for use in concrete aggregate.

The quality of the stone is dependent on the cementing material. The higher the percentage of silica as cement, the better the quality of the quartzite.

The total volume of stone estimated to be available is 107 mill. cu. yds. Of this figure 83 % is thought to be under option to quarry interests for varying periods up to about 15 years.

Large volumes of calcareous rocks (Brighton limestone) are available in the south of the area reconnoitred. This rock is suitable for use in civil engineering projects and in

concrete aggregate.

It is recommended that prior to any quarry site being opened up, a detailed geological inspection be carried out of the proposed development area.

Nixon

21-2-57.

L. G. NIXON,
GEOLOGIST.

APPENDIX. Part I.

NAME:	Maryvale Quarry.
OPERATOR:	F.Carson (Maryvale Quarries).
LOCATION:	Section 554, Hd. Adelaide (Black Hill, Fifth Creek).
ACCESS:	Good bitumen road alongside.
REFERENCE:	-
TITLE:	Government Quarry Reserve.
GEOLOGY:	Stonyfell Quartzites, dip about 40°S.
DEVELOPMENT, PRODUCTION, PLANT:	Quarry production has been about 220,000 cu. yds. Plant seen was - 1. Combination dozer and front-end loader. 2. Crushing plant, including hoppers, chute, screens, etc.
RESERVES:	These extend N.W. and E. but the present limits of the quarry are near section boundaries. Reserves not less than 2,000,000 cu. yds. if extended into the hill to the north. Access (?)
REMARKS:	No quarrying at present. Crusher is being used at the moment. Would be visible from Adelaide if extended to north and had benches higher up the hill.
PHOTOS:	See mosaic, for Rockdale.
NOTED BY:	L.G. Nixon.
DATE:	1st February, 1957.
LOCALITY PLAN:	57-86 No. 1.

APPENDIX. Part I.

NAME:	Rockdale Quarry.
OPERATOR:	Quarry Industries.
LOCATION:	Sections 304, 305, Hd. Adelaide.
ACCESS:	Good bitumen road parallel to and alongside the deposit.
REFERENCE:	-
TITLE:	Col. A.G. Fox. Minerals - owner. It is understood that Quarry Industries Ltd. hold quarrying rights of these sections.
GEOLOGY:	Stonyfell quartzite dipping between 5 and 50° to the south. These quartzites are overlain by silty quartzites and sandy quartzites, in turn overlain by good quality quartzites, poor material seen in traverse uphill is about 25% of the total outcrop seen.
DEVELOPMENT, PRODUCTION, PLANT:	Production to date ia over 88,000 cu. yds. Plant consists of a mechanical shovel, dozers, weighbridge, blacksmiths shop, petrol bowzer, weighbridge and shed and crushing plant.
RESERVES:	Reserves are estimated to be between 25,000,000 and ~~50~~,000 cu. yds. of quartzite. 50,000,000
REMARKS:	Out of sight of Adelaide at present.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	4th February, 1957.
LOCALITY PLAN:	57-86 No. 1.

Maryvale Quarries.

Rockdale Quarries (Quarry Industries). Secs. 304,305, boundaries of sections extend to top of hill. Hd. Adelaide.

APPENDIX. Part I.

NAME:	-
OPERATOR:	-
LOCATION:	Sections 305 and 997. Hd. Adelaide (Black Hill).
ACCESS:	Poor. One narrow unmetalled track to foot of cliff. Better track along top of hill.
REFERENCE:	-
TITLE:	Section 305, A.G. Fox. Minerals - owner. Section 997, V. & K. Dawkins. Minerals - owner.
GEOLOGY:	Flat dipping. Stonyfell quartzite formation, well jointed and massive. Sediments are white, with a siliceous cement medium-grained tough. Some poorer quality sandy quartzite observed, but proportion to better quality rock is small. Montacute fault immediately to the east. Silicification along fault zone probable.
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	Reserves are estimated to be about 3,000,000 cu. yds. Some poorer quality stone will probably be encountered. Being a white sandy stone would be marketable if mined with the quartzite.
RECOMMENDATION:	The area be opened up for quarrying.
REMARKS:	Out of sight of Adelaide. Proximity to Montacute fault probably improved quality of stone. Quarry rights on Section 305 understood to be held by Quarry Industries Ltd.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	4th February, 1957.
LOCALITY PLAN:	57 - 86 No. 1.

APPENDIX. Part I.

NAME:	-
OPERATOR:	No quarry operations to date.
LOCATION:	Section 830. Hd. Adelaide. (Black Hill).
ACCESS:	Bitumen road alongside the deposit.
REFERENCE:	-
TITLE:	A.G. Fox, Montacute Road, Montacute. Minerals - owner. Subject to E.T.S.A. easement. It is understood that the area is under option to Quarry Industries Ltd.
GEOLOGY:	Stonyfell quartzite formation, dipping south.
DEVELOPMENT, PRODUCTION, PLANT:	Nil.
RESERVES:	Reserves are estimated to be about 5 million cu. yds.
RECOMMENDATION:	The area be opened up for quarrying.
REMARKS:	Out of sight of Adelaide. Col. Fox has dam on south side of hill and may object to blasting operations.
PHOTOS:	See mosaic showing Rockdale Quarries.
NOTED BY:	L. G. Nixon.
DATE:	31st January, 1957.
LOCALITY PLAN:	57-86 No. 1.

APPENDIX. Part I.

NAME:	Three Sugar Loaves. Black Hill.
OPERATOR:	-
LOCATION:	Section 998, Hd. Adelaide.
ACCESS:	Poor. Old tracks exist, but would have to be widened and surfaced. Best approach to gully from west.
REFERENCE:	-
TITLE:	W. Smith, Athelstone. Minerals - owner.
GEOLOGY:	Stonyfell quartzites. Beds dipping at a shallow angle to the south. Underlain by phyllitic slates.
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	1. Northern spur reserves are estimated to be 1,500,000 cu. yds. 2. Eastern spur - volume about 1,000,000 cu. yds. but overlain by equal volume of sandy quartzites.
RECOMMENDATIONS:	1. Quality of rock at northern spur be given abrasion tests. 2. Area be shown to any interested party to see if it can be worked by mixing overburden (white sandy quartzite) with quartzite.
REMARKS:	1. Rock appears to be of inferior quality but may be marketable as coarse aggregate. Out of sight of city. 2. Underlying quartzite of fairly good quality. Out of sight of city.
PHOTOS:	-
NOTED BY:	L.G. Nixon.
DATE:	4th February, 1957.
LOCALITY PLAN:	57-86 No. 2.

APPENDIX. Part I.

NAME:	-
OPERATOR:	-
LOCATION:	Section Bk. 334. Hd. Onkaparinga.
ACCESS:	Good. Bitumen road within a few hundred feet of the deposit.
REFERENCE:	-
TITLE:	V.R.S. & A.A. Gowland, W.G. Hersey, A.J. Schulz. Minerals reserved to the Crown. Pt. Sec. subject to lease 1634028 to Dolomite Quarries Ltd.
GEOLOGY:	Quartzites in the lower phyllites of the Torrensian series in the Proterozaic rocks of the Adelaide system. Fault striking approximately N - S runs through the area. Beds dip at a shallow angle to the southerly.
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	Reserves are estimated to be between 5 and 10 million cu. yds.
REMARKS:	Out of sight of Adelaide. Could be easily worked.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	8th February, 1957.
LOCALITY PLAN:	57-86 No. 3.

APPENDIX. Part I.

NAME:	-
OPERATOR:	-
LOCATION:	Sections 1163, 1164, 1166. Hd. Adelaide.
ACCESS:	Good. All-weather metalled road to deposit.
REFERENCE:	-
TITLE:	1163 - C.R.W. and C.M. Todd, D.H. and M.J. Smith - minerals - owner. 1164 - G.G. Holliday, B.H.J. Helgeson, D.G.Allmond - minerals - owner. 1166 - E.H. Green, J.W. and F.A. Green, executors of the estate of late R.D. Green.
GEOLOGY:	Sandy quartzites and quartzites of the Stonyfell formation. Secondary silicification ? along fault direction. Ratio of sandy quartzites to quartzites about 50 : 50.
DEVELOPMENT, PRODUCTION, PLANT:	Nil.
RESERVES:	Estimated reserves 2 million cu. yds. of sandy quartzites and quartzites.
RECOMMENDATION:	The area be opened up for quarrying. Further investigations be undertaken for testing the sands for use as fine aggregate in concrete and other building projects.
REMARKS:	C.R.W. Todd advised that C.M. Willington (Mining Engineer) collected sand sample from this area and that the sand was reported to be suitable as fine aggregate use in concrete.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	25th January, 1957.
LOCALITY PLAN:	57-86 No. 4.

APPENDIX. Part I.

NAME:	Giles Range.
OPERATOR:	White Rock Quarries in part of Section 1109.
LOCATION:	Sections 1107, 1108, 1109. Hd. Adelaide.
ACCESS:	Good to White Rock Quarries. Would need widening slightly further east and metalling. Only wood cutters tracks, at present unnegotiable, up to the deposit.
REFERENCE:	-
TITLE:	Pt. 1107, A. Smith.) subject to caveat by Pt. 1164 L.A. Gardiner.) Quarry Industries Ltd. 1108) M. Marano - subject to caveat by 1109) Quarry Industries Ltd.
GEOLOGY:	Massive Stonyfell Quartzite outcrop. Underlain by phyllite slates and bounded by faults. Quartzite is massive, hard and dense.
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	**Reserves are estimated to be about 10,000,000 cu. yds.**
RECOMMENDATION:	The deposit be opened up for quarrying.
REMARKS:	The above-mentioned reserves do not take into account a thinner quartzite horizon to the east which, though not in itself worth exploiting, could be worked when the main deposit is opened up.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	22nd January, 1957.
LOCALITY PLAN:	57-86 No. 5.

APPENDIX. Part I.

NAME:	-
OPERATOR:	-
LOCATION:	Section 1150, 1184. Hd. Adelaide (near Ashton).
ACCESS:	Poor at present. Only wood cutters tracks exist into the area.
REFERENCE:	D.M.1881/54.
TITLE:	Sec. 1150 pt. A.S. Lovibond, R.S. Lovibond, Max Lovibond. 1150 pt. F.L. Lovibond. 1150 pt. D.B.E. Miller. Minerals - owner. Sec. 1184 (Land Grant. Minerals - owner) F.K. Griffiths, J.F. Pascoe, E.W. Maywary, as Executors named in the will of late C. Giles.
GEOLOGY:	Stonyfell Quartzites overlain and underlain by 'phyllites'. The Clarendon-Ochre-Cove fault striking east of north flanks the eastern margin of the Stonyfell Quartzites in this area. Evidence of silicification can be seen further south along the strike of the fault.
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	Reserves are estimated to be between 1 million and 2 million cu. yds.
RECOMMENDATION:	**The area be opened up for quarrying.**
REMARKS:	Cost of widening and reconditioning the road is estimated between £3,000 - £4,000. Out of sight of Adelaide.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	7th February, 1957.
LOCALITY PLAN:	57-86 No. 6.

APPENDIX. Part I.

NAME:	-
OPERATOR:	-
LOCATION:	Section 1020, Hd. Adelaide.
ACCESS:	Very poor. Old wood cutters tracks exist but would have to be widened, graded and metalled.
REFERENCE:	-
TITLE:	J.N. and C.V. Yates. Minerals - owners.
GEOLOGY:	Top of the Stonyfell Quartzites. Beds dip between 15 - 25° southerly. Torrensian Series. Adelaide System. Pre Cambrian age.
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	Reserves are estimated to be about 3,000,000 cu. yds. of which about 1,000,000 cu. yds. would be better quality stone.
RECOMMENDATION:	The area be further investigated.
REMARKS:	These reserves would include sandstones and inferior quality Quartzites. Ratio of quartzites to sandstones and poor quality rock 1 : 2. Actual extent of siliceous arenaceous sediments is very much greater.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	17th January, 1957.
LOCALITY PLAN:	56 - 86 No. 7.

APPENDIX. Part I.

NAME:	-
OPERATOR:	-
LOCATION:	Section 1076, 1077. Hd. Adelaide.
ACCESS:	Good on Section 1076 and would need little work to recondition existing tracks on Section 1077.
REFERENCE:	-
TITLE:	Section 1076. W.H. Wylie - subject to encumbrance No. 1126426 to Springfield Ltd. Subject to waterworks easement. Subject to Commonwealth easement. Section 1077. Pt. Sec. Corporation of City of Unley. Pt. Sec. M.W. Hardy - Minerals - owner.
GEOLOGY:	Folded Quartzite horizon not less than 100ft. thick overlain and underlain by phyllitic slates. Rocks are of Precambrian age belonging to the Sturtian Series. Belair Formation in the Adelaide System Rocks.
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	Reserves are estimated to be between 2 and 3 million cu. yds. These reserves include those mentioned under Glen Osmond Quarries, Southern Group (1) Eastern Upper Quartzite Quarry.
RECOMMENDATION:	This area be opened up for quarrying purposes.
REMARKS:	Partly in view from northern suburbs but well back in the hills. Best prospect seen to date.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	10th January, 1957.
LOCALITY PLAN:	57-86 No. 8.

APPENDIX. Part I.

NAME:	Glen Osmond Quarries. Southern Group. 1. Eastern Upper Quartzite Quarry.
OPERATOR:	Quarry Industries. Not being worked at present.
LOCATION:	Section 1077, Hd. Adelaide.
ACCESS:	Old track to quarry. Would have to be reconditioned for use.
REFERENCE:	-
TITLE:	Pt. Section The Corportion of the City of Unley. Pt. Section M.W. Hardy. Minerals - owners.
GEOLOGY:	Massive and flaggy quartzite and sandy quartzite beds overlain and underlain by phyllitic slates of the Belair slates and quartzites Group in the Sturtian Series of the Adelaide System Rocks of Pre-Cambrian age.
DEVELOPMENT, PRODUCTION, PLANT:	Quarry at present 50ft. (h) x 100ft. (long) x 70ft. (w)
RESERVES:	Could be extended southwards and with further benches developed at higher levels and to the east reserves would be in the vicinity of 1 million cu. yds. These reserves are included in those previously mentioned describing syncline and anticlinal structure. See previous page.
RECOMMENDATION:	Quarry be reopened for operations.
REMARKS:	Quarry could be re-worked without much delay. Partly in view of northern suburbs.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	10th January, 1957.
LOCALITY PLAN:	57-86 No. 8.

APPENDIX. Part I.

NAME:	Linwood Quarries.
OPERATOR:	Quarry Industries Ltd.,
LOCATION:	Eastern part of Section 215, Hd. Noarlunga. Approximately ¼ - ½ mile south of Cement Works and ¼ mile east of aerial ropeway. Essentially out of sight of Adelaide.
ACCESS:	½ mile from south end of Brighton Road.
REFERENCE:	D.M. 1388/56. S.A.P.C. Co.
TITLE:	South Australian Portland Cement Co.
GEOLOGY:	Marinoan and Sturtian Series of Adelaide System Limestones (dolomitic (?) and siliceous (?)) on the east grading through to purple and grey slates on the west.
DEVELOPMENT, PRODUCTION, PLANT:	8,000 tons a week; target 15,000 tons per week.
RESERVES:	Quarry can be extended into western 2/3rds of Section 215 and this would increase reserves 3 - 5+times. Extra faces and/or floors would be necessary.
RECOMMENDATION:	-
REMARKS:	Being operated by Quarry Industries.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	6th December, 1956.
LOCALITY PLAN:	57-86 No. 9.

APPENDIX. Part I.

NAME:	-
OPERATOR:	Disused.
LOCATION:	Western edge of Section 249, Hd. Noarlunga. Out of sight of Adelaide.
ACCESS:	Adjoins metal road and within ½ mile of a bitumen road.
REFERENCE:	-
TITLE:	J.A. Sheidow. Subject to lease by Linwood Quarries. Term of lease 25 years as from 2-7-1945.
GEOLOGY:	Brighton Limestone, Sturtian Series, Adelaide System. On west limb of an anticline near its nose.
DEVELOPMENT, PRODUCTION, PLANT:	Two quarries, one on each side of gully. 60-80,000 cu. yds. -
RESERVES:	Two million cu. yds. (?) including area of limestone outcrop to the east. Note that these beds are included in Section 248 reserves.
RECOMMENDATION:	Should be considered as a potential quarry site for south western end of city; area to east to be considered.
REMARKS:	-
PHOTOS:	1. Looking 187° to S quarry. 2. Looking 72" to N quarry (mosaic of 2 photos).
NOTED BY:	L. G. Nixon and G. F. Whitten.
DATE:	6th December, 1956.
LOCALITY PLAN:	57-86 No. 10.

APPENDIX. Part I.

NAME: -

OPERATOR: Disused.

LOCATION: Section 248, Hd. Noarlunga.
Out of sight of Adelaide.

ACCESS:
1. 1½ miles southerly from Marino over farmtracks.
2. ¾ miles westerly from bitumen road near O'Halloran Trig.

REFERENCE: -

TITLE: Owned by Mr. Sheidow; subject to Caveat by Quarry Industries Ltd.

GEOLOGY: Brighton Limestone, Sturtian Series, Adelaide System. Massive beds dipping westerly 40-60° with minor laminated limestone and slate beds.
Strong cleavage dipping 20 - 50° east.
Limestone runs over a width of 20 + chains.

DEVELOPMENT, PRODUCTION, PLANT: Four disused quarries exist in a gully near a homestead.
-

RESERVES: Quarry sites exist both north and south of the gully and probably in excess of 5 million cu. yds. could be extracted from each.
Allow 25% unsuitable stone.

RECOMMENDATION: Should be considered as potential quarry sites for south western end of city.

REMARKS: -

PHOTOS: Looking 160° towards limestone on south side of gully. Quarries are just west of photo.

NOTED BY: L. G. Nixon and G. F. Whitten.

DATE: 6th December, 1956.

LOCALITY PLAN: 57-86 No. 10.

APPENDIX. Part II.

NAME:	-
OPERATOR:	-
LOCATION:	Section Bk. 331; 5539 Hd. Onkaparinga (off Torrens Gorge).
ACCESS:	Poor, no tracks to deposit. All roads would have to be made.
REFERENCE:	Mining Reviews 47, 72, 76. Geological Survey Bulletin 13.
TITLE:	Sections 331, 5539, W. Smith. Minerals reserved to Crown.
GEOLOGY:	Quartzite bed in phyllites of the Torrensian series in the Adelaide System rocks of Pre Cambrian age. The quartzite is tough, white and highly siliceous. The Montacute fault strikes northerly alongside the deposit. The country rock has been silicified, mineralised and brecciated.
RESERVES:	Reserves are estimated to amount to about 170,000 cu. yds.
RECOMMENDATION:	-
REMARKS:	Out of sight of Adelaide. Some mining has been done along the fault zone for barytes. Mineral rights reserved to the Crown. Excellent site for location of quarry.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	7th February, 1957.
LOCALITY PLAN:	57-86 No. 1.

APPENDIX. Part II.

NAME:	-
OPERATOR:	-
LOCATION:	Section 996, Hd. Adelaide.
ACCESS:	Bitumen road runs across the south of spur. Other track must be made.
REFERENCE:	-
TITLE:	Pt. Section Public Trustee for estate late S. Smith. Pt. Section Mrs. E. E. Smith, Minerals - owner.
GEOLOGY:	Silicified shattered zone in phyllites with two horizons of sandy quartzites which have been silicified (not shown on Regional Map). Sediments belong to the Torrensian series of Pre Cambrian age in the Adelaide System rocks.
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	Reserves are estimated to exceed 400,000 cu. yds.
RECOMMENDATION:	Should be considered as a possible quarry site.
REMARKS:	Out of sight of Adelaide. A silicified fault zone on the west side of the gully would provide several thousand cubic yards in addition to the main deposit.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	7th February, 1957.
LOCALITY PLAN:	57-86 No. 2.

APPENDIX. Part II.

NAME:	-
OPERATOR:	-
LOCATION:	Section 1163, Hd. Adelaide.
ACCESS:	Poor, unmetalled woodcutters' tracks to west on hill.
REFERENCE:	-
TITLE:	D.H. & M. J. Smith. Minerals - owners.
GEOLOGY:	Stonyfell quartzite formation. Quartzite is a bed of more highly siliceous rock than the overburden or undermass but along the spur it is thought that adjacent to a suspected fault secondary silicification of the undermass and overmass has rendered the rock suitable for use as aggregate.
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	Estimated reserves are not less than 150,000 cu. yds.
RECOMMENDATION:	Appears to warrant further investigation.
REMARKS:	Too small on its own but as the bed extends to the south, development of the area may prove further reserves. Out of sight of Adelaide.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	25th January, 1957.
LOCALITY PLAN:	57-86 No. 3.

APPENDIX. Part II.

NAME:	-
OPERATOR:	-
LOCATION:	Section 810, 822, Hd. Adelaide.
ACCESS:	Poor to within a few hundred feet of deposit where no track exists. Best approach up gully to west.
REFERENCE:	-
TITLE:	Pt. Section D.P., D.J., M.P., B.J., G.A. McCarthy. Minerals - owners. Other Pt. Section Morialta Falls Reserve.
GEOLOGY:	Stonyfell Quartzites. Horizon of hard siliceous medium grained, trough, white - pinky quartzite, overlain and underlain by sandy quartzites and freestone.
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	Estimated to be about 500,000 cu. yds.
RECOMMENDATION:	-
REMARKS:	Can be seen from northern suburbs, i.e. Klemzig but is back from scarp. North side of creek needs trenching or pitting to expose bed rock. With development further reserves would probably be proved.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	24th January, 1957.
LOCALITY PLAN:	57-86 No. 4.

APPENDIX. Part II.

NAME:	-
OPERATOR:	-
LOCATION:	Section 1183. Hd. Adelaide.
ACCESS:	Track negotiable to within ¼ mile of deposit but would have to be widened before use. Last ¼ mile rough track needing lots of work.
REFERENCE:	-
TITLE:	A.L. Green, H.A.L. Green. Minerals reserved to the crown.
GEOLOGY:	Base of the Stonyfell Quartzites overlying lower phyllites (after Sprigg).
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	Estimated at about 500,000 cu. yds.
RECOMMENDATION:	-
REMARKS:	Percentage of sandstone to Quartzite, appears to be 50 - 50 Actual extent of stone much greater. With development, reserves will probably be greatly increased.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	11th January, 1957.
LOCALITY PLAN:	57-86 No. 5.

APPENDIX. Part II.

NAME:	-
OPERATOR:	-
LOCATION:	Section 1179, 1019, Hd. Adelaide.
ACCESS:	Good at the time of investigation, but needs metalling.
REFERENCE:	-
TITLE:	Section 1178. Stonyfell Quarries Ltd. Minerals - owners. Subject to E.T.S.A. easement over portion of section. Section 1019. Summertown Timber & Trading Co.Ltd. Minerals - owner.
GEOLOGY:	Siliceous quartzite horizon in the Stonyfell quartzite formation east of Stonyfell quarry. Beds dip to south east.
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	Estimated at about 600,000 cu. yds.
RECOMMENDATION:	This area should be considered as a future quarry site.
REMARKS:	Can be seen from southern suburbs of Adelaide but is well back in the hills. Reserves would probably be increased with development.
PHOTOS:	-
NOTED BY:	L.G. Nixon.
DATE:	23rd January, 1957.
LOCALITY PLAN:	57-86 No. 6.

APPENDIX. Part II.

NAME:	-
OPERATOR:	Has been used as a dump. Quarry Industries agents for Quarries Ltd.
LOCATION:	Section 1054. Hd. Adelaide (Waterfall Gully area).
ACCESS:	Between road up to old quarries. Old track marked out along creek, badly neglected, needs widening and surfacing before use.
REFERENCE:	-
TITLE:	Quarries Ltd. Minerals - owner.
GEOLOGY:	Stonyfell Quartzites (after Sprigg). A bed of hard quartzite in overlain and underlain by poorer quality white sandy quartzites. Good quality horizon is estimated to be about 65ft. thick. Beds dip shallowly to the south.
DEVELOPMENT, PRODUCTION, PLANT:	Production estimated at 200,000 cu. yds.
RESERVES:	Reserves estimated at + 200,000 cu. yds.
RECOMMENDATION:	Reserves are based on quarrying excavations being confined to the northern side of the creek only. If quarry operations are extended to the southern side of the creek, another 50,000 to 100,000 cu. yds. may be available.
REMARKS:	-
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	7th January, 1957.
LOCALITY PLAN:	57-86 No. 7.

APPENDIX. Part II.

NAME:	-
OPERATOR:	-
LOCATION:	Sections 924, 984, 1172. Hd. Adelaide.
ACCESS:	Poor, existing roads will have to be re-graded, widened and surfaced.
REFERENCE:	-
TITLE:	National Pleasure Resort, probably under Tourist Bureau.
GEOLOGY:	Quartzite bed, tough white, felspathic, about 30ft. thick, dipping 10° to the south, interbedded with phyllitic slates. Sediments belong to the Torrensian Series in the Adelaide system rocks of Pre Cambrian age.
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	In Sections (1) 1172, (2) 924, (3) 984. (1) 1172 Estimated reserves are not less than 88,000 cu. yds. (2) and (3) Estimated reserves 15,284 cu. yds. (3) 984 Estimated reserves about 88,000 cu. yds. Total reserves are about 200,000 cu. yds.
RECOMMENDATION:	-
REMARKS:	Would be seen from Adelaide although well back from the scarp. Would probably scar skyline.
PHOTOS:	See Appendix Part III.
NOTED BY:	L. G. Nixon.
DATE:	8th January, 1957.
LOCALITY PLAN:	57-86 No. 8.

APPENDIX. Part II.

NAME:	-
OPERATOR:	-
LOCATION:	Section 2203, Hd. Adelaide.
ACCESS:	Could be easily made accessible from eastern side. Tracks have already been cut from that direction.
REFERENCE:	-
TITLE:	A. K. Ashby. Minerals - owner.
GEOLOGY:	Good siliceous quartzites, beds of variable thickness from 3ft. beds to less than 1ft. grading to siliceous silty slates. Rocks of Belair slates and quartzites formation of Sturtian Series, Adelaide System. The beds have been folded into an anticline pitching southerly between 15 -20°.
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	Estimated reserves are about 300,000 cu. yds.
RECOMMENDATIONS:	The deposit requires no further work at this juncture.
REMARKS:	Out of sight of Adelaide. Deposit too small for plant installation and road making for Adelaide markets.
PHOTOS:	1 photo bearing 130° looking along gully.
NOTED BY:	L. G. Nixon.
DATE:	20th December, 1956.
LOCALITY PLAN:	57-86 No. 9.

APPENDIX. Part II.

NAME:	-
OPERATOR:	-
LOCATION:	Section 1046, Hd. Adelaide.
ACCESS:	Through old railway tunnell. Some road making necessary.
REFERENCE:	-
TITLE:	A. M. Ashby. Minerals - owner. Other parts Section 1046 subdivided as Eden Hills.
GEOLOGY:	Good siliceous quartzites, beds of variable thickness, i.e. from over 3 ft. to thinly laminated less than 1ft. and grading to a siliceous silty slate.
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	Estimated reserves are thought to be about 100,000 cu. yds.
RECOMMENDATION:	If this area is considered as a possible future source of stone, all the smaller quartzite deposits be mapped for possible quarry sites.
REMARKS:	Out of sight of Adelaide. Some road making would have to be done. Width of tunnell 14ft. 8 in. Height 15ft. 8 in. No houses in the area at the time of inspection.
PHOTOS:	2 photographs bearing 210°.
NOTED BY:	L. G. Nixon.
DATE:	20th December, 1956.
LOCALITY PLAN:	57-86 No. 10.

APPENDIX. Part II.

NAME:	-
OPERATOR:	-
LOCATION:	Section 1048, Hd. Adelaide.
ACCESS:	Poor unmetalled dirt track but could be developed at small cost.
REFERENCE:	-
TITLE:	Adelaide Quarries Ltd. Minerals - owner. (Agents Quarry Industries).
GEOLOGY:	Interbedded slates laminated and massive Quartzites and poorly developed Tillite. Beds are contorted and folded, two horizons seen here average about 100ft. each. Rocks belong to the Torrensian Series of the Adelaide System and belong to the Belair Group.
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	Width average 100ft. (2 beds), depth 20 yds., length 200 yds. Volume about 240,000 cu. yds.
RECOMMENDATION:	Be kept on record for local uses.
REMARKS:	Out of sight of Adelaide.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	18th December, 1956.
LOCALITY PLAN:	57-86 No. 11.

APPENDIX. Part II.

NAME:	-
OPERATOR:	Not working (?)
LOCATION:	Section 199, extending into NW corner of Section 198, Hd. Noarlunga. Almost out of sight of Adelaide,
ACCESS:	On southern end of Brighton Road.
REFERENCE:	Sampled for Lightweight Aggregate for S.A. Portland Cement Co. See D.M. 725/56. Not satisfactory.
TITLE:	Subdivided as Seacliff Park in LTO Plans 2424, 3089, 3156, 3169.
GEOLOGY:	Sturtian Series of Adelaide System. Relatively massive but probably impure siliceous (?) dolomitic (?) limestone. Folded 20 - 50ft. crest to crest, pitching south. Best beds probably run in direction of Marino Golf Club House.
DEVELOPMENT, PRODUCTION, PLANT:	A small quarry now disused. 10,000 cu. yds. approximately. -
RESERVES:	**Unconsolidated overburden 5 - 10ft. possibly still** being sold as fill. Weathered rock 0 - 10ft. Could be used as fill. Unweathered rock to 100ft. in Section 199 - 3 - 400,000 cu. yds. No real idea of contamination.
RECOMMENDATION:	Suitable only as a small quarry, perhaps as an adjunct to Linwood. May be used at present as a source of fill.
REMARKS:	-
PHOTOS:	-
NOTED BY:	L. G. Nixon and G.F. Whitten.
DATE:	6th December, 1956.
LOCALITY PLAN:	57-86 No. 12.

APPENDIX. Part II.

NAME:	Brighton Cement Quarry (under ropeway).
OPERATOR:	S.A. Portland Cement Co. (?) but not now working.
LOCATION:	Section 197, Hd. Noarlunga. Almost out of sight of Adelaide immediately sath of Cement Works.
ACCESS:	On southern end of Brighton Road.
REFERENCE:	-
TITLE:	S.A. Portland Cement Co. subject to Caveat by Concrete Investments Pty. Ltd. G.H. Waterman, Commission of Waterworks.
GEOLOGY:	Sturtian Series of Adelaide System. Probably Brighton Limestone. Massive beds folded into an anticline pitching very flatly south. Prominent EW near vertical jointing, also joints dipping flatly south.
DEVELOPMENT, PRODUCTION, PLANT:	One disused quarry exists. Possible 100,000 - 150,000 cu. yds. None - used as dump by Cement Works.
RESERVES:	Area could be extended W and SW to develop 500,000 cu. yds. between present quarry and road to Linwood Quarry. Probably not suitable for cement manufacture.
RECOMMENDATION:	Should be considered as a new quarry if developed before housing encroaches too closely.
REMARKS:	-
PHOTOS:	Centre of 2 photo. mosaic looks 200°. Photos taken from N edge of quarries and show anticlinal structure on South face.
NOTED BY:	L. G. Nixon and G.F. Whitten.
DATE:	6th December, 1956.
LOCALITY PLAN:	57-86 No. 13.

APPENDIX. Part III.

NAME:	-
OPERATOR:	-
LOCATION:	Section 2203 and Railway Land, Hd. Adelaide.
ACCESS:	Road (unsurfaced) right up to deposit.
REFERENCE:	-
TITLE:	A.K. Ashby of Blackwood. Minerals - owner.
GEOLOGY:	Quartzites and interbedded slates of the Belair group. The bed is about 100' thick interbedded with slates. Sediments are of Pre Cambrian age and belong to the Sturtian Series in the Adelaide System.
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	Reserves are estimated to about 60,000 cu. yds.
RECOMMENDATION:	To be worked together with other small deposits in the area if area is opened up.
REMARKS:	Out of sight of Adelaide.
PHOTOS:	-
NOTED BY:	L.G. Nixon.
DATE:	20th December, 1956.
LOCALITY PLAN:	-

APPENDIX. Part III.

NAME: Halletts White Shale Quarry.

OPERATOR: Hallett, J. & Son Ltd.

LOCATION: Pt. Section 1042, Hd. Adelaide.

ACCESS: Good. All weather access roads. Bitumen road 150 yards to the north and west.

REFERENCES: G.S.B. 12 pp. 49-50 (Wrongly numbered 1043 in Bull. 12).

TITLE: Hallett & Son Ltd. of Welland. Mineral rights alienated from the Crown.

GEOLOGY: Sturtian Series of the Adelaide System called here the Belair Quartzites and slates. Beds strike northerly and dip about 45° to the east.

DEVELOPMENT, PRODUCTION, PLANT: This quarry has been worked for an estimated 70 years. An outcrop of Quartzite forming an anti-cline pitching to the south is used as a broad division for the quarries. Those to the east called the eastern quarries and that to the west the western quarry. Production from eastern quarries about 350,000 cu. yds, that from the western quarry is thought to be about 150,000 - 200,000 cu. yds. Total production = 500,000 cu. yds.

RESERVES: The eastern quarry could be extended north about 100 ft. and east 20 ft. Reserves of shale from these extensions would be about 80,000 cu. yds. A bed of quartzite to the east, exposed by this work would have reserves estimated to be about + 70,000 cu. yds.

RECOMMENDATION: The deposit of quartzite is not large enough to warrant further investigation as a potential quarry site. No further work should be done in the area at this juncture.

REMARKS: Out of sight of Adelaide.

PHOTOS: No. 1 & 2. Looking 015° (to centre of Mosaic).

NOTED BY: L.G. Nixon.

DATE: 18th December, 1956.

LOCALITY PLAN: -

APPENDIX. Part III.

NAME:	-
OPERATOR:	-
LOCATION:	Section 1076, Hd. Adelaide.
ACCESS:	Unmetalled track to deposit. Could easily be paved to take heavy transport.
REFERENCES:	-
TITLE:	W.H. Wylie. Minerals - owner. Subject to Encumbrance No. 1126426 to Springfield Ltd, Waterworks Easement and Commonwealth Easement.
GEOLOGY:	Thin bed of quartzite and sandy quartzite inter-bedded between phyllite slates. Quartzite bed is between 10' - 20' thick, dipping shallowly to the south.
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	Reserves estimated at about 5,000 cu. yds.
RECOMMENDATION:	**Too small by itself to warrant opening up.**
REMARKS:	**Out of sight of Adelaide.** May be worked if larger deposit to N.E. is opened up. See Appendix 1.
NOTED BY:	L.G. Nixon.
DATE:	9th January, 1956.
LOCALITY PLAN:	-

APPENDIX. Part III.

NAME: -

OPERATOR: -

LOCATION: Pt. Section 5654, Hd. Adelaide.

ACCESS: Poor, over steep unmade tracks.

REFERENCE: -

TITLE: W. Smith. Minerals - owner.

GEOLOGY: Upper phyllites with interbedded, hard, pink-white, tough fine-grained quartzites. Beds folded into a syncline pitching about 15-25° S. Flanked to east by the Montacute fault. Silicification is evident along the fault zone. Quartzites in two horizons probably silicified by soaking from hydrothermal solutions.

DEVELOPMENT, PRODUCTION, PLANT: -

RESERVES: Estimated to be about 18,000 cu. yds for smaller syncline. Estimated to be about 16,000 cu. yds available from larger syncline.

RECOMMENDATION: No further work on this deposit at this juncture.

REMARKS: Out of sight of city. Deposit is too small to warrant further work. May be used locally when road is being built. Not marked on regional map.

PHOTOS: -

NOTED BY: L.G. Nixon.

DATE: 5th February, 1957.

LOCALITY PLAN: -

APPENDIX. Part III.

NAME:	Torrens Valley Quarry.
OPERATOR:	Quarry Industries Ltd. Agents for Torrens Valley Quarry Ltd.
LOCATION:	Section 818, Hd. Adelaide.
ACCESS:	Poor. Roads to quarry need grading. Bitumen road alongside bins.
REFERENCE:	-
TITLE:	J.P.A. Ryan, J. Daly, R.T.P. Ryan, C.J.M. Atkinson. Minerals - owner. Subject to lease No. 1435933 to Torrens Valley Quarry Ltd. for 15 years from 1-7-45.
GEOLOGY:	Stonyfell Quartzites overlain by phyllites. Beds dip at shallow angle to the south.
DEVELOPMENT, PRODUCTION, PLANT:	Production is estimated to have been about 90,000 cu. yds. Plant consists of dilapitated crushing plant, screens, bins, 6 chutes (for different screenings and a separate bin for spallings?) and a bin for spallings. Plant would have to be reconditioned before use. 3 sheds and an old petrol bowser.
RESERVES:	**Approximately +90,000 cu. yds.**
RECOMMENDATION:	Reserves in sight do not warrant opening up and reworking at this juncture.
REMARKS:	Out of sight of city.
PHOTOS:	-
NOTED BY:	L.G. Nixon.
DATE:	6th February, 1957.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME:	-
OPERATOR:	-
LOCATION:	South east corner of Section 2200, Hd. Adelaide.
ACCESS:	Good installed road across quartzite.
REFERENCE:	-
TITLE:	A. K. Ashby (Information from Land Tax records).
GEOLOGY:	Quartzite slates and (Tillites?) in Sturtian Series of Adelaide System. Beds contorted. Pitch of folds south. Quartzite massive, of good quality.
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	Reserves would be between 5,000 - 10,000 cu. yds.
RECOMMENDATION:	The area be abandoned as a potential quarry site.
REMARKS:	Too near houses to be opened up.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	18th December, 1956.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME:	-
OPERATOR:	-
LOCATION:	Section 1041, Hd. Adelaide.
ACCESS:	Fairly easy to get at.
REFERENCE:	-
TITLE:	E. K. & W. M. Jones. Minerals - owners.
GEOLOGY.	Folded and overturned slates. Tillites and quartzites of the Sturtian Series in the Adelaide System rocks of Pre Cambrian Age. Fold structures plunge southwards.
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	Bed 1 synclinal about 50ft. wide pitching south. Reserves small. Bed 2 (s) about 48ft. thick, dip steep east. Laminated but good quality. Suitable for concrete aggregate.
RECOMMENDATION:	**Area to be abandoned as potential quarry site. Too small to warrant further work.**
REMARKS:	Out of sight of Adelaide. Syncline exposed in railway cutting.
PHOTOS:	Syncline of W. bed. Bearing southerly.
NOTED BY:	L. G. Nixon.
DATE:	18th December, 1956.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME:	-
OPERATOR:	-
LOCATION:	Section 1048, Hd. Adelaide.
ACCESS:	Poor. No road to site. Railway line cuts across horizon.
REFERENCE:	-
TITLE:	Subdivided as "Belair Park" on L.T.O. Plan 802.
GEOLOGY:	Slates, quartzites and tillites, Adelaide System, Sturtian Series. Beds dip westerly.
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	Reserves are estimated to amount to about 10,000 cu. yds.
RECOMMENDATION:	Because of small quantity of reserves and subdivision of block, it is recommended the area be abandoned.
REMARKS:	Between house to south and railway line to north. Would probably have complaints from neighborhood. Northern part of deposit extends into grazing paddock. Not suitable as coarse aggregate.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	18th December, 1956.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME:	-
OPERATOR:	-
LOCATION:	Sections 1172 and 984, Hd. Adelaide.
ACCESS:	Poor at the moment from Mt. Lofty and even worse from the west.
REFERENCE:	-
TITLE:	Part of National pleasure resort.
GEOLOGY:	Quartzite and sandy quartzite horizon interbedded with slates and phyllites. Sediments belong to the phyllites of the Torrensian series in the Adelaide System rocks of Pre Cambrian age.
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	Reserves are estimated to be about 18,000 cu. yds.
RECOMMENDATION:	-
REMARKS:	**In view of Adelaide, but well back in the hills. Could be worked in conjunction with other deposits in Sections 924, 984, 1172, see** Appendix Part II.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	20th February, 1957.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME:	-
OPERATOR:	-
LOCATION:	Section 827-828, Hd. Adelaide.
ACCESS:	Good. Bounded to north by bitumen road.
REFERENCE:	-
TITLE:	A. G. Fox, Montacute Road. Minerals - owner.
GEOLOGY:	Stonyfell Quartzite formation of the Torrensian Series in the Adelaide System rocks. Beds are overlain by interbedded phyllites and quartzites of the upper phyllites formation.
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	Estimated reserves 30,000 cu. yds.
RECOMMENDATION:	The area be abandoned as a potential quarry site.
REMARKS:	Main road nearby together with telephone lines and house. Out of sight of Adelaide. Maryvale Quarries operating in part Section 828.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	24th January, 1957.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME:	-
OPERATOR:	Not being worked at present.
LOCATION:	Section 1144, Hd. Adelaide.
ACCESS:	Good, about ¼ mile from bitumen road to the west.
REFERENCE:	
TITLE:	Sub divided. Reference L.T.O. plans 2308, 4805, 5239, 4726, 2653.
GEOLOGY:	Belair slates and quartzite group, of the Sturtian Series in the Adelaide System rocks of Pre Cambrian age.
DEVELOPMENT, PRODUCTION, PLANT:	850,000 cu. yds. of slate.
RESERVES:	Could be extended N.W. and S.E. Reserves would be between 500,000 to 1,000,000 cu. yds.
RECOMMENDATION:	Area be abandoned.
REMARKS:	Out of sight of Adelaide. Area subdivided into building blocks.
PHOTOS:	Looking about 170°S.
NOTED BY:	L.G. Nixon.
DATE:	19th December, 1956.
LOCALITY PLAN:	

APPENDIX. Part IV.

NAME: -

OPERATOR: -

LOCATION: Section 12, Hd. Adelaide.

ACCESS: Metalled road, but not in very good order. All weather access.

REFERENCE: -

TITLE: J. Quinn, Adelaide Investments Ltd., Melbourne.

GEOLOGY: Massive - flaggy - laminated white-grey quartzites and slates, folded and faulted. Beds belong to the Belair Group in the Sturtian Series of the Adelaide System and are Pre Cambrian in age.

DEVELOPMENT, PRODUCTION, PLANT:

1. South Quarry. Production estimated to have been 100,000 cu. yds.
2. Central Quarry. Production estimated to have been 150,000 cu. yds.
3. North Quarries:
   a. Eastern Quarry. Production estimated to have been 50,000 cu. yds.
   b. Western Quarry. Production estimated to have been 60,000 cu. yds.

RESERVES: Reserves are estimated to total about 200,000 cu. yds.

RECOMMENDATION: Since the area is near existing buildings and has already been divided into building blocks, it is unlikely that the area is of further interest.

REMARKS: Can be seen from Adelaide.

PHOTOS:

1. Central Quarry bearing 010°
2. Southern Quarry bearing 170°
3. North Quarry
   a. Bearing 190°
   b. Bearing 190°

NOTED BY: L. G. Nixon.

DATE: 8th December, 1956.

LOCALITY PLAN: -

APPENDIX. Part IV.

NAME:	Bonython Hill.
OPERATOR:	-
LOCATION:	Section 1094, Hd. Adelaide.
ACCESS:	By dirt track, but no very steep gradients except near deposit.
REFERENCE:	-
TITLE:	W.H. Wylie. Subject to encumbrance No. 1126426 to Springfield Ltd. Subject to Waterworks easement and Commonwealth easement.
GEOLOGY:	Interbedded quartzites and slates of the Belair group in the Sturtian Series of the Adelaide System rocks, Pre Cambrian in age.
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	Reserves estimated between 20,000 - 40,000 cu. yds.
RECOMMENDATION:	**Can be seen from Adelaide. No further work be carried out at this juncture.**
REMARKS:	In view of Adelaide.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	9th January, 1957.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME:	-
OPERATOR:	Has not been opened up.
LOCATION:	Section 1080. Hd. Adelaide, near crest of hill at eastern boundary of section. (Sleeps Hill Quarries area).
ACCESS:	Could be easy from east side along crest of hill.
REFERENCE:	-
TITLE:	Adelaide Quarries Ltd. Minerals - owner. Agents - Quarry Industries Ltd.
GEOLOGY:	Quartzite of good quality interbedded with slates. These beds are in the Belair slates and quartzites group in the Sturtian formation of the Adelaide System.
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	Reserves are estimated to be about 300,000 cu. yds.
RECOMMENDATION:	Could be developed but is in view of Adelaide. Further work would not be warranted at this stage.
REMARKS:	-
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	22nd December, 1956.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME:	-
OPERATOR:	-
LOCATION:	Section 252, Hd. Noarlunga. On railway one mile south of Marino Rocks.
ACCESS:	Difficult - suburban roads at Marino.
REFERENCE:	D.M. 55/44. "Report on Proposed Ballast Quarry near Hallett's Cove".
TITLE:	Government Reserve.
GEOLOGY:	Marinoan Series Adelaide System. A series of soft chocolate silty shales - soft red to white sandstones dipping west - probably too soft to be considered as aggregate but said to be tested by the Railways Department and proved to be satisfactory for ballast. (See D.M. 55/44).
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	Estimated by E. Broadhurst as 8,400,000 tons. This requires checking as two diamond drill holes totalling 269ft. 6in failed to penetrate good stone.
RECOMMENDATION:	No further work at this stage.
REMARKS:	-
PHOTOS:	-
NOTED BY:	L. G. Nixon. G.F. Whitten.
DATE:	6th December, 1956.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME:	Sleeps Hill Quarries. Northern Group. Western-most quarry.
OPERATOR:	Adelaide Quarries Ltd. Not operating now.
LOCATION:	Section 1147. Hd.
ACCESS:	Good. Road to quarry entrance.
REFERENCE:	-
TITLE:	Adelaide Quarries Ltd. Minerals - owner.
GEOLOGY:	Massive, flaggy and laminated quartzites inter-bedded in slates. Beds dip steeply to the east and strike northerly. The sediments belong to the Belair slates and quartzites formation of the Sturtian Series.
DEVELOPMENT, PRODUCTION, PLANT:	Estimated to be 14,000 cu. yds.
RESERVES:	Negligible.
RECOMMENDATION:	Abandon the area as potential quarry site.
REMARKS:	If developed would be seen from Adelaide.
PHOTOS:	1. Bearing 350°.
NOTED BY:	L.G. Nixon.
DATE:	23rd January, 1957.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME:	Sleeps Hill Quarries, Northern Group. Second from west quarry.
OPERATOR:	Not in operation. Adelaide Quarries Ltd., Agents - Quarry Industries Ltd.
LOCATION:	Section 1147, Hd. Adelaide.
ACCESS:	Good. Metalled road past quarry.
REFERENCE:	-
TITLE:	Adelaide Quarries Ltd. Minerals - owner.
GEOLOGY:	Folded quartzites overlain by weathered slates. Sediments belong to the Belair Group of quartzites and slates in the Sturtian Series of the Adelaide System rocks of Pre Cambrian age.
DEVELOPMENT, PRODUCTION, PLANT:	Estimated at 110,000 cu. yds.
RESERVES:	Reserves extend to the north and would amount to about 100,000 cu. yds. but would be in sight of the city.
RECOMMENDATION:	No further work be done here unless the quarries are to be reworked.
REMARKS:	Would be in sight of city if further developed.
PHOTOS:	Bearing 355°.
NOTED BY:	L. G. Nixon.
DATE:	23rd January, 1956.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME:	Sleeps Hill Quarries. Northern Group. Central Quarry (adjacent to quarries above chinaman).
OPERATOR:	Not operating now. Adelaide Quarries Ltd. Agents - Quarry Industries Ltd.
LOCATION:	Section 1147, Hd.
ACCESS:	Good to entrance of quarry.
REFERENCE:	-
TITLE:	Adelaide Quarries Ltd. Minerals - owner.
GEOLOGY:	Tightly folded and overturned anticline of quartsite pitching southerly. Beds belong to the Belair group in the Sturtian Series of the Adelaide System rocks of Pre Cambrian age.
DEVELOPMENT, PRODUCTION, PLANT:	Estimated at 32,000 cu. yds.
RESERVES:	To the north, possibly 5,000 cu. yds.
RECOMMENDATION:	Because it is small, and would be seen from the city if further quarrying were done, it is recommended that no further work be done here at this juncture.
REMARKS:	Would be in sight of city if extended. Could be used to boost production if other quarries were opened up.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	23rd January, 1956.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME: Sleeps Hill Quarries. Northern Group. Under Windy Point corner.

OPERATOR: Adelaide Quarries Ltd. Not working at the present time. Agents - Quarry Industries Ltd.

LOCATION: Section 1147, Hd. Adelaide extending northwards into railway land.

ACCESS: Good, but tracks need some clearing and conditioning.

REFERENCE: -

TITLE: Adelaide Quarries Ltd. Minerals - owner.

GEOLOGY: Quartzites interbedded in laminated slates of the Belair Slates and Quartzites group in the Sturtian Series belonging to the Adelaide System rocks of Pre Cambrian age.

DEVELOPMENT, PRODUCTION, PLANT: One old plant and bins near the railway line. Out of order.

1. Eastern quarries (2 above chinaman and 1 south of road).

   a. Easternmost Quarry - production estimated to be 19,800 cu. yds.
   b. Western Quarry - production estimated to be 75,000 cu. yds.
   c. South of Road Quarry - production estimated to be 11,000 cu. yds.

RESERVES:

a. No. 1 Too near road under Windy Point, no reserves available.
b. Could be extended north. Reserves estimated to be about 16,000 cu. yds.
c. Could be extended to the south east. Reserves estimated to be about 40,000 cu. yds.

RECOMMENDATION: b and c. By themselves these deposits would not warrant further attention, but in conjunction with a general re-opening of the quarries, the reserves may be increased with development. Being in sight of Adelaide it is recommended that no further work be done here.

REMARKS: c. Can be seen from Adelaide and southern suburbs. All future development would be in view of Adelaide. Quarries have been used as a dump.

PHOTOS: One photograph bearing 010° showing two quarries above chinaman. One photograph bearing 180° showing quarry to south of the road.

NOTED BY: L. G. Nixon.

DATE: 19th December, 1956.

LOCALITY PLAN: -

APPENDIX. Part IV.

PHOTOS.

Easternmost Quarry and Western Quarry.

South of Road Quarry.

APPENDIX. Part IV.

NAME: Sleeps Hill Quarries. Northern Group. North of Windy Point corner.

OPERATOR: Adelaide Quarries Ltd. Not being worked at present time. Agents - Quarry Industries Ltd.

LOCATION: Section 1146. Hd. Adelaide.

ACCESS: Unmetalled road, would need to be reconditioned to take heavy traffic. Within quarry area tracks need regrading and surfacing.

REFERENCE: -

TITLE: Adelaide Quarries Ltd. Minerals - owner.

GEOLOGY: Belair Group of slates and quartzites of the Sturtian Series in the Adelaide System rocks of Pre Cambrian age.
The Central quarry was worked entirely for slates and in slates. The eastern (smaller quarry) quarry was worked for quartzite. A thrust fault runs along the western margin of the Eastern quarry.

DEVELOPMENT, PRODUCTION, PLANT:

1. Central Quarry. Overburden increases to south. Production estimated to be about 220,000 cu. yds.

2. Eastern Quarry. Overburden increases to south. Production estimated to be about 38,000 cu. yds.

Total production 258,000 cu. yds.

RESERVES: To the south, but not available because of the road in that direction.

RECOMMENDATION: No further search for quartzites in this area be undertaken.

REMARKS: In sight of Adelaide.

PHOTOS: -

NOTED BY: L. G. Nixon.

DATE: 19th January, 1957.

LOCALITY PLAN: -

APPENDIX. Part IV.

NAME:	Sleeps Hill Quarries. Northern Group. North Western Quarry.
OPERATOR:	Adelaide Quarries Ltd. Not working. Agents - Quarry Industries Ltd.
LOCATION:	Section 1146, Hd. Adelaide, western edge, north west of Windy Point corner.
ACCESS:	Along graded road to within 100 yds. of quarry.
REFERENCE:	-
TITLE:	Adelaide Quarries Ltd. Minerals - owner.
GEOLOGY:	Mainly quartzites overlain by siliceous siltstones and faulted. Underlying the quartzite is fine grained flaggy quartzites suitable for cement aggregate. Beds belong to the Belair Group of slates and quartzites in the Sturtian Series of the Adelaide System.
DEVELOPMENT, PRODUCTION, PLANT:	Estimated to be 140,000 cu. yds.
RESERVES:	Not large enough in itself to warrant further work. Because it is in sight of Adelaide, the quarry site would not be suitable. If the whole group of quarries is to be opened up, this quarry could be re-worked.
REMARKS:	In sight of Adelaide.
PHOTOS:	Three photographs. Bearing to centre of mosaic 170°.
NOTED BY:	L. G. Nixon.
DATE:	19th December, 1956.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME: Sleeps Hill Quarries. Central Group. North west Quarry.

OPERATOR: Adelaide Quarries Ltd. Not working.
Agents - Quarry Industries Ltd.

LOCATION: Sections 1147, 1148. Hd. Adelaide.

ACCESS: Poor up to actual quarries. Would need to be opened up.

REFERENCE: -

TITLE: Adelaide Quarries Ltd. Minerals - owner.

GEOLOGY: Belair slates and quartzites in the Sturtian Series. The quartzite horizon is tightly folded and overturned plunging to the osuth between 20 - 30°. Pitch is about 50°S. Core of anticline crumpled.

DEVELOPMENT, PRODUCTION, PLANT: About 130,000 cu. yds. of good quality stone.

RESERVES: Reserves to the north estimated at between 50,000 - 100,000 cu. yds. but would be in view of Adelaide.

RECOMMENDATION: Too small to warrant re-opening by itself.

REMARKS: In view of Adelaide. Could be opened up if all the quarries were re worked.

PHOTOS: Two bearing 350°.

NOTED BY: L. G. Nixon.

DATE: 23rd January, 1957.

LOCALITY PLAN: -

APPENDIX. Part IV.

NAME:	South Central Quarry. Sleeps Hill Quarries. Central Group.
OPERATOR:	Glen Osmond Quarries Ltd. Not operating at time of inspection. Agents - Quarry Industries.
LOCATION:	Section 1143, Hd. Adelaide.
ACCESS:	Very bad at the present time, but could easily be fixed.
REFERENCE:	-
TITLE:	Glen Osmond Quarries Ltd. Minerals - owner.
GEOLOGY:	Belair group, Sturtian Series, Adelaide System, Pre Cambrian age. Quartzite beds are vertical near the top of the quarry face but flatten to the west near the base of the quarry (see photo and sketch).
DEVELOPMENT, PRODUCTION, PLANT:	Estimated to have been about 177,000 cu. yds. One old plant now dilapidated and useless.
RESERVES:	These are located southwards from the eastern portion of the quarry and extend south. Reserves are estimated to be about 190,000 cu. yds.
RECOMMENDATION:	No further work is recommended at this stage.
REMARKS:	In view of Adelaide.
PHOTOS:	One bearing 190°. One showing ripple marks on eastern wall of quarry.
NOTED BY:	L. G. Nixon.
DATE:	21st December, 1956.
LOCALITY PLANS:	-

Ripple marked silty slates

Qtzites.

Phyll-ites.

Syn-clinal axis

Closer view of ripple marks.

APPENDIX. Part IV.

NAME:	Sleeps Hill Quarries. Central Group. North Central Quarry.
OPERATOR:	Adelaide Quarries Ltd. Not working. Agents - Quarry Industries Ltd.
LOCATION:	Sections 1147, 1148. Hd. Adelaide.
ACCESS:	Poor to quarries. Near railway line.
REFERENCE:	-
TITLE:	Adelaide Quarries Ltd. Minerals - owner.
GEOLOGY:	Belair slates and quartzites in the Sturtian Series of the Adelaide System. The quartzite horizon worked is an open synclinal fold pitching southerly.
DEVELOPMENT, PRODUCTION, PLANT:	About 70,000 cu. yds.
RESERVES:	Estimated to be at least 70,000 cu. yds.
RECOMMENDATION:	Too small to be opened on its own. As it is in view of Adelaide it should not be re worked.
REMARKS:	In view of Adelaide.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	23rd January, 1957.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME:	Sleeps Hill Quarries. Central Group. South Eastern Quarry.
OPERATOR:	Adelaide Quarries Ltd. Not operating now. Agents - Quarry Industries Ltd.
LOCATION:	Section 1148, Hd. Adelaide.
ACCESS:	Very poor to quarry at the present time. Best approach for future development, from crest of hill to the east.
REFERENCE:	-
TITLE:	Adelaide Quarries Ltd. Minerals - owner.
GEOLOGY:	Quartzites and interbedded silty ripple ? marked slates (siliceous). Quartzite is tough very siliceous slightly feldspathic white - grey in colour. Bed is the west limb of the anticline. East wall is silty ripple marked sediment nearly vertical. Overburden is 8ft. at the face.
DEVELOPMENT, PRODUCTION, PLANT:	Excavation 300' x 150' x 100' = 150,000 cu. yds.
RESERVES:	To the south east of the quarry a continuation of the bed already quarried. Reserves about 40,000 cu. yds.
RECOMMENDATION:	Reserves too small to warrant further development at present. Area be abandoned.
REMARKS:	In view of city.
PHOTOS:	1. Bearing 170°.
NOTED BY:	L. G. Nixon.
DATE:	20th December, 1956.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME:	Sleeps Hill Quarries. Central Group. South West Quarry.
OPERATOR:	Glen Osmond Quarries Ltd. Not in operation at time of inspection. Agents - Quarry Industries.
LOCATION:	Section1143, Hd. Adelaide.
ACCESS:	Quite good and easily accessible.
REFERENCE:	-
TITLE:	Glen Osmond Quarries Ltd. Minerals - owners.
GEOLOGY:	Belair slates and quartzite group, Sturtian Series. Quarry is located in bed of quartzite folded into an anticline pitching south about 25°. Fault to west running about NS. Overburden of slates off south east and east side.
DEVELOPMENT, PRODUCTION, PLANT:	Estimated to be about 150,000 cu. yds.
RESERVES:	Negligible.
RECOMMENDATION:	No further work at this stage.
REMARKS:	In view of Adelaide, southern suburbs.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	21st December, 1956.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME: Central Group of Sleeps Hill Quarries.

OPERATOR: Adelaide Quarries Ltd. Not working.
Agents - Quarry Industries Ltd.

LOCATION: Sections 1147, 1148, Hd. Adelaide.

ACCESS: -

REFERENCE: -

TITLE: Adelaide Quarries Ltd. Minerals - owner.

GEOLOGY: Belair slates and quartzite group of the Sturtian Series in the Adelaide System rocks of Pre Cambrian age. The sediments in this area are tightly folded. Many of the folds overturned and pitching southerly.

DEVELOPMENT, PRODUCTION, PLANT:

1. Central Western Quarry. Dimension 450' long x 150' wide x 80' av. high. Rock type good quality white-grey quartzite, ripple marked siltstones. Quarrying operations stopped because of depth of overburden. Reserves limited by overburden (12') if overburden could be disposed of, extensions could be made south. In view of Adelaide.

2. Central second from West Quarry. Dimensions 500' long x 150' wide x av. height 50'. Overburden ratio between 1:2 and 1:3½. Reserves to South but cannot be quarried because of overburden. In view of Adelaide.

3. Central Second from East Quarry. 150' x 100' x 65'. Reserves in S.W. corner and striking S.W. Beds white quartzite 100' thick. Beds complexly folded and faulted.

4. Central Eastern Quarry. Structure overturned anticline axis dipping 20-30°E. Quarry 600' long, av. 400' wide, 300' high. Reserves to S.W. Pitching 30°S.W. In view of Adelaide if extended.

5. North east Quarry. Average height 2 benches 150'. Height of benches 300'.

RECOMMENDATION: No further work in the area.

REMARKS: -

PHOTOS:

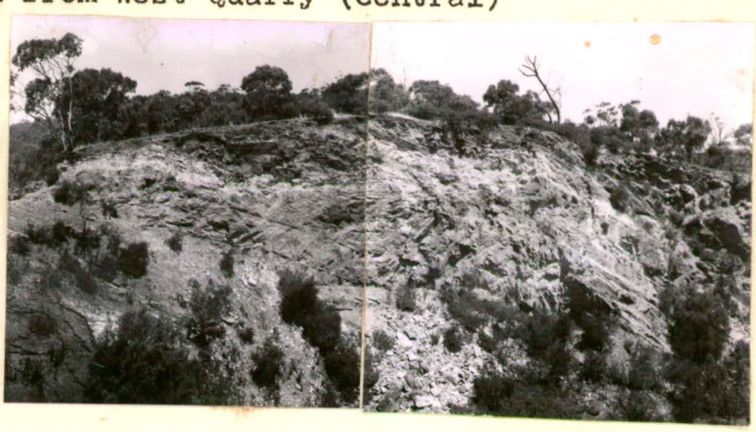
NOTED BY: L. G. Nixon.

DATE: 20th December, 1956.

LOCALITY PLAN: -

Sleeps Hill Quarries.
Central Group.

Sleeps Hill Quarries
Central Group.
2nd from West Quarry (central)



Sleeps Hill Quarries.
Central Group. Central Western
Quarry.

Sleeps Hill Quarries
Central G.P. N.W. Quarry.

Close up of N.W.Quarry
Central Group.

Sleeps Hill Quarries
Central Group. N.E.
Quarry.

APPENDIX. Part IV.

NAME:	Sleeps Hill Quarries.
OPERATOR:	Adelaide Quarries Ltd. Not operating now. Agents - Quarry Industries Ltd.
LOCATION:	Section 1074. Hd. Adelaide.
ACCESS:	Poor but little work needed to put it in order.
REFERENCE:	-
TITLE:	Adelaide Quarries Ltd. Minerals - owner.
GEOLOGY:	Belair group of quartzites and slates of the Sturtian Series in the Adelaide System rocks of Pre Cambrian age. Rock is good quality grey-white quartzite.
DEVELOPMENT, PRODUCTION, PLANT:	-
RESERVES:	150ft. wide, about 600ft. long, depth 250ft. See previous report on eastern quarry of Sleeps Hill Group. This is possible extension of that bed.
RECOMMENDATION:	Area be abandoned as it can be seen from the city.
REMARKS:	In view of city.
PHOTOS:	-
NOTED BY:	L.G. Nixon.
DATE:	19th December, 1956.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME: Sleeps Hill Quarries. Southern Group.

OPERATOR: Adelaide Quarries Ltd. Not working.
Agents - Quarry Industries Ltd.

LOCATION: Section 1074, Hd. Adelaide.

ACCESS: Good roads to all the quarries.

REFERENCE: -

TITLE: Adelaide Quarries Ltd. Minerals - owners.

GEOLOGY: Sediments are interbedded quartzites and slates of the Belair Group in the Sturtian Series belonging to the Adelaide System rocks of Pre Cambrian age. In this area the beds are tightly folded and in some cases overturned.

DEVELOPMENT, PRODUCTION, PLANT:
1. Westernmost quarry - production estimated to have been about 400,000 cu. yds.
2. Easternmost quarry - production estimated to have been about 600,000 cu. yds.

RESERVES:
1. Estimated reserves to the south of the quarry are about 50,000 cu. yds.
2. Reserves extend to the south but increasing overburden ratio would curtail extension in that direction.
3. Reserves extend southwards and would be about 100,000 cu. yds. but would be seen from Adelaide.

RECOMMENDATION: If any of these quarries are extended they would be even more evident than they are now. No further work is recommended in the area.

REMARKS: Area is in sight of southern suburbs and if extended would be seen from Adelaide.

PHOTOS:
1. Central quarry showing anticline bearing 180°.
2. Eastern quarry showing overturning of beds bearing 300°.

NOTED BY: L. G. Nixon.

DATE: 20th December, 1956.

LOCALITY PLAN: -

APPENDIX. Part IV.

NAME:	Anderson's Quarry. Southern Group. South Quarry.
OPERATOR:	Glen Osmond Quarries Ltd. Not operating now. Agents - Quarry Industries Ltd.
LOCATION:	Section 1143, Hd. Adelaide.
ACCESS:	Good, but road needs widening and improving for modern vehicular traffic.
REFERENCE:	-
TITLE:	Glen Osmond Quarries Ltd. Minerals - owners.
GEOLOGY:	Quartzites overlain and underlain by laminated slates. Beds occur in the Belair Group of slates and quartzites of the Sturtian Series in the Adelaide System rocks of Pre Cambrian age.
DEVELOPMENT, PRODUCTION, PLANT:	Estimated at 70,000 cu. yds. Fault on north end limits reserves in that immediate direction.
RESERVES:	Overburden would limit quarrying westwards. Road and housing blocks limit extensions to the south.
RECOMMENDATION:	Area be abandoned as possible future quarry site.
REMARKS:	Just in view of Adelaide.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	8th January, 1957.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME: Andersons Quarries. Southern Group.
1. Central quarry.
2. North quarry.

OPERATOR: Glen Osmond Quarries Ltd. Not operating now.
Agents - Quarry Industries Ltd.

LOCATION: Section 1143, Hd. Adelaide.

ACCESS: Good but would have to be reconditioned prior to use.

REFERENCE: -

TITLE: Glen Osmond Quarries Ltd. Minerals - owner.

GEOLOGY: Massive quartzites overlain and underlain by slates. Beds are gently warped, dipping south easterly. Sediments are part of the Belair group of slates and quartzites in the Sturtian series of the Adelaide System rocks of Pre Cambrian age.

DEVELOPMENT, PRODUCTION, PLANT:
1. Central Quarry - production estimated to be about 45,000 cu. yds.
2. North Quarry - reserves are estimated to be about 132,000 cu. yds.

Overlying rock is grit. Underlying rock slates.

RESERVES:
1. Reserves to the north are estimated to be about 200,000 cu. yds.
2. Reserves to the north are estimated to be about 218,000 cu. yds.

RECOMMENDATION:
1. Abandon area. Housing blocks too near and could be seen from city, especially when extended to spur.

REMARKS:
1. In view of Adelaide. Area thought to be sub-divided into building blocks.

PHOTOS: -

NOTED BY: L. G. Nixon.

DATE: 8th January, 1957.

LOCALITY PLAN: -

APPENDIX. Part IV.

NAME:	Anderson's Quarry. Central Group. 1. Eastern Lower Quartzite Quarry. 2. Western Lower Quartzite Quarry.
OPERATOR:	Glen Osmond Quarries Ltd., Not operating now. Agents - Quarry Industries Ltd.
LOCATION:	Section 1143, Hd. Adelaide.
ACCESS:	Good.
REFERENCE:	-
TITLE:	Glen Osmond Quarries Ltd. Minerals - owners.
GEOLOGY:	Quartzite and sandy quartzites underlain and overlain by laminated slates. These beds are thought to be the same as those worked above in the Eastern Quartzite Quarries, Central Group. Sediments belong to the Belair Group of the Sturtian Series in the Adelaide System and are of Pre Cambrian age.
DEVELOPMENT, PRODUCTION, PLANT:	1. Production estimated to be about 1600 cu. yds. 2. Production estimated to be about 13,000 cu. yds.
RESERVES:	1. Eastwards estimated to contain between 8,000 - 10,000 cu. yds. 2. Nil. Houses to north and overburden to east.
RECOMMENDATION:	Could be developed, but housing in the area may put end to operations.
REMARKS:	May be seen from southern suburbs but not conspicuous.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	9th January, 1957.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME:	Andersons Quarries. Central Group. Lower Eastern Slate Quarries.
OPERATOR:	Glen Osmond Quarries Ltd. Not operating. Agents - Quarry Industries Ltd.
LOCATION:	Section 1140, Hd. Adelaide.
ACCESS:	Fairly good. Roads in need of repair.
REFERENCE:	-
TITLE:	Glen Osmond Quarries Ltd. Minerals - owners.
GEOLOGY:	1. Slates laminated, grey, tough, overlain by quartzites. Sediments belong to the Belair Group of the Sturtian Series in the Adelaide System rocks of Pre Cambrian age.
DEVELOPMENT, PRODUCTION, PLANT:	1. West Quarry (slate) production estimated to be about 32,000,000 cu. yds. 2. East Quarry (slate) production estimated to be about 66,500 cu. yds.
RESERVES:	1. To the north west and to the south and south west under old plant. 2. To the east to boundary fence 120ft. and to the south east towards quarry.
RECOMMENDATION:	Area to be abandoned for quarrying purposes.
REMARKS:	In view of Adelaide.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	9th January, 1957.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME:	Andersons Quarries? East and below Eastern Quarries Central Group.
OPERATOR:	Quarry Industries ? Now used as dump.
LOCATION:	Section 1993, Hd. Adelaide.
ACCESS:	Within 150 yds. of bitumen road, parallel to Brownhill Creek. Tracks to quarries in poor state of repair.
REFERENCE:	-
TITLE:	Darlington Heights Ltd.
GEOLOGY:	Quartzite horizon overlain and underlain by laminated slates. Quartzite is good quality. 70 - 50" thick. Beds belong to the Belair Group in the Sturtian Series of the Adelaide System rocks of Pre Cambrian age.
DEVELOPMENT, PRODUCTION, PLANT:	1. Quarry to north is 100' x 70' x 50'. 2. Quarry to south worked on same horizon is 100' wide x 300' long x 35' high. Faulted along south margin. No reserves in the area.
RESERVES:	Cannot be extended.
RECOMMENDATION:	-
REMARKS:	Out of sight of Adelaide. Would not be worth re opening on its own.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	9th January, 1957.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME: Andersons Quarries. Central Group. Upper Eastern Quarries.

OPERATOR: Glen Osmond Quarries Ltd. Not operating now. Used as dump. Agents - Quarry Industries Ltd.

LOCATION: Section 1140, Hd. Adelaide.

ACCESS: Within 200 yds. of a bitumen road. Roads would have to be fixed up, but would not need much work.

TITLE: Glen Osmond Quarries Ltd. Minerals - owners.

GEOLOGY: Quartzite beds overlain and underlain by slates and interbedded slates and quartzites of the Belair group in the Sturtian Series.

DEVELOPMENT, PRODUCTION, PLANT:

1. Western Quarries - this is a series of small quarries formed by selective quarrying. Production estimated to be about 600,000 cu. yds. Quarry now old dump.
2. Eastern Quarry - Production estimated to have been about 200,000 cu. yds. Overburden ratio now 1 : 4. Overburden is slate. Quarry now old dump. The bed worked in this quarry is also quarried at a lower level to the west. Fault at right hand edge of photo.

RESERVES:

1. Western Quarries. On present land to the east for at least 200ft. would have to watch for traffic on road to east. Lower bunch could be started. Overburden small.
2. Eastern Quarry. Reserves to be worked on the flanks of the spur. Overburden would increase rapidly to the south.

RECOMMENDATION: No further work be carried out in this area.

REMARKS: In view of Adelaide.

PHOTOS:

1. Photograph 2. Bears 160° to centre of mosaic).
2. 2 photos. 130° to centre of mosaic.

NOTED BY: L. G. Nixon.

DATE: 8th January, 1957.

LOCALITY PLAN: -

APPENDIX. Part IV.

NAME:	Andersons Quarries. Central Group. Western Quarries.
OPERATOR:	Glen Osmond Quarries Ltd. Agents - Quarry Industries Ltd.
LOCATION:	Section 1140, Hd. Adelaide.
ACCESS:	Good.
REFERENCE:	-
TITLE:	Glen Osmond Quarries Ltd. Minerals - owner.
GEOLOGY:	Quartzite, white tough fine-medium grained, overlain by a grit (quartzite) and underlain by slates. Grits overlain by slates. Slates are grey laminated and tough. Sediments belong to the Belair slates and quartzites group of the Sturtian Series in the Adelaide System rocks of Pre Cambrian age.
DEVELOPMENT, PRODUCTION, PLANT:	1. West Quarry - Production estimated at 132,000 cu. yds. Overburden 5ft. thickest where exposed over quarry face. 2. East Quarry - Production estimated at 156,000 cu. yds. 3. West Slate Quarry 250' x 100' x 50'. Old crushing plant and screens in building. Plant would need extensive overhaul.
RESERVES:	1. West Quarry - to the south west. 2. Beds extend southwards. 3. Reserves can be quarried east and north of quarry or to south on south side of the creek.
RECOMMENDATIONS:	No further quarry operations be carried out in this area.
REMARKS:	In view of Adelaide. Probably source of stone for building purposes in the early days.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	8th January, 1957.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME:	Anderson's Quarries, Central Group, Lower Western Quarry.
OPERATOR:	Glen Osmond Quarries Ltd. Not operating now. Agents - Quarry Industries Ltd.
LOCATION:	Section 1140, Hd. Adelaide.
ACCESS:	Good.
REFERENCE:	-
TITLE:	Glen Osmond Quarries Ltd. Minerals - owners.
GEOLOGY:	Folded and faulted quartzites overlain and probably underlain by slates. Fault along west margin of existing quarry. Sediments are in the Belair slates and quartzites group of the Sturtian Series.
DEVELOPMENT, PRODUCTION, PLANT:	Estimated to be about 66,500 cu. yds.
RESERVES:	Reserves extend to the south west but are in view of the city in that direction.
RECOMMENDATIONS:	No further work to be done in the area.
REMARKS:	In view of Adelaide and would be more so with further development.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	9th January, 1957.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME:	Anderson's Quarries, Central Group, East Slate Quarry.
OPERATOR:	Glen Osmond Quarries Ltd. Not operating now. Agents - Quarry Industries Ltd.
LOCATION:	Section 1140, Hd. Adelaide.
ACCESS:	Good.
REFERENCE:	-
TITLE:	Glen Osmond Quarries Ltd. Minerals - owner.
GEOLOGY:	Laminated blue-grey slates underlying quartzites of Southern Quarries and Upper Eastern Quarries. Sediments are mapped as the Belair group of quartzites and slates in the Sturtian Series of the Adelaide System rocks of Pre Cambrian age.
DEVELOPMENT, PRODUCTION, PLANT:	Estimated to have been about 14,500 cu. yds.
RESERVES:	Reserves are to the north of the quarry and are estimated to be about 66,000 cu. yds.
RECOMMENDATION:	No further work to be done in the area.
REMARKS:	Only partly in sight of Adelaide, but with further development more rock would be seen. The stone is no longer in demand for building purposes.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	8th January, 1957.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME:	Andersons Quarries? Northern Group. 1. Eastern quarry. 2. Central quarry. 3. Western quarry.
OPERATOR:	Andersons Quarries Ltd. Not operating. Agents - Quarry Industries.
LOCATION:	Section 1094, Hd. Adelaide.
ACCESS:	Roads would need clearing. Bitumen road 100 yds. south.
REFERENCE:	-
TITLE:	W. H. Wylie. Subject to encumbrance No. 1126426 to Springfield Ltd., and waterworks and Commonwealth easements.
GEOLOGY:	Interbedded quartzites and slates of the Belair Group in the Sturtian Series of the Adelaide System rocks of Pre Cambrian age.
DEVELOPMENT, PRODUCTION, PLANT:	1. Production estimated to have been 45,000 cu. yds. 2. Production estimated to have been 88,000 cu. yds. 3. Production estimated to have been
RESERVES:	1. Cannot be extended because of road and houses to the north. 2. Cannot be extended because of road, power station, etc. 3. Reserves to north have already been quarried.
RECOMMENDATION:	Area needs no further investigation. No available reserves left.
REMARKS:	In sight of Adelaide.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	8th January, 1957.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME:	Glen Osmond Quarries, Southern Group. Slate Quarry.
OPERATOR:	Quarry Industries? Agents } Not being worked at present.
LOCATION:	Section 1077, Hd. Adelaide.
ACCESS:	Good, but road needs clearing of olive trees and some metalling.
REFERENCE:	-
TITLE:	Corporation of the City of Unley and M.W. Hardy. Minerals - owners.
GEOLOGY:	Massive and flaggy laminated dary grey and greenish grey slates, overlain by massive quartzite. Sediments belong to the Belair group in the Sturtian Series of the Adelaide System rocks of Pre Cambrian age.
DEVELOPMENT, PRODUCTION, PLANT:	Estimated to have been about 274,000 cu. yds.
RESERVES:	Quarry could be extended to the east but there is no longer a great demand for this type of stone for building purposes.
RECOMMENDATION:	This stone is no longer in demand and no further work is recommended at this juncture.
REMARKS:	Owned by the Unley Corporation. In hills away from scarp. Out of sight of Adelaide.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	10th January, 1957.
LOCALITY PLAN:	-

APPENDIX. Part IV.

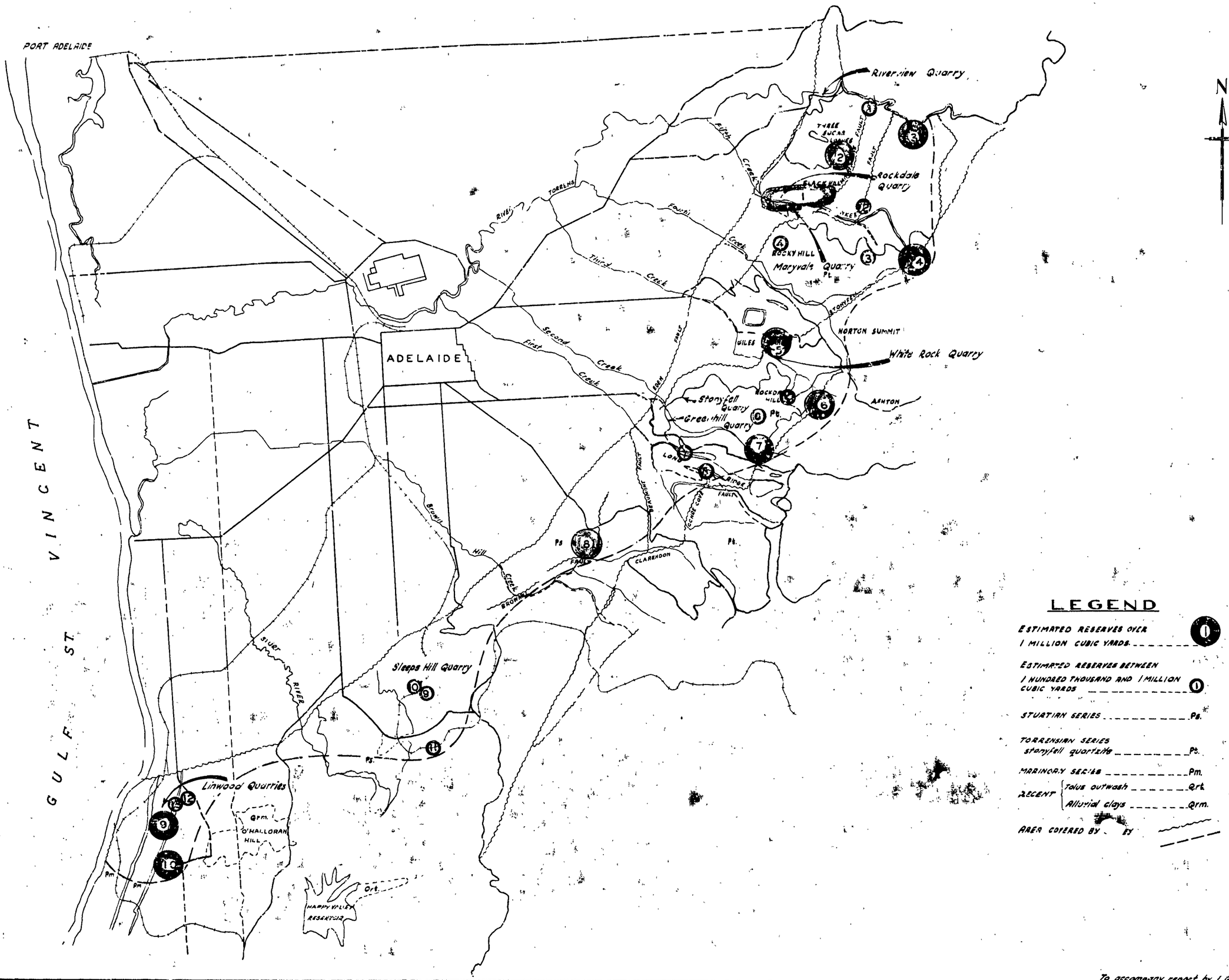
NAME:	Glen Osmond Quarries. Southern group. Lower Eastern Quartzite Quarry.
OPERATOR:	Not working at present. Glen Osmond Quarries Ltd. Agents - Quarry Industries Ltd.
LOCATION:	Section 1077, Hd. Adelaide.
ACCESS:	Good, bitumen road within 100 yds.
REFERENCE:	-
TITLE:	Unley Corporation. Pt. Section M.W. Mardy.
GEOLOGY:	Massive Quartzite bed about 75 ft. thick overlain by slates. Overburden about 8ft. at quarry face at present. Fault on east edge makes this bed the same as that higher up. Sediments belong to the Belair group in the Sturtian Series of the Adelaide System rocks of Pre Cambrian age.
DEVELOPMENT, PRODUCTION, PLANT:	Estimated production - 1. 161,000 cu. yds. 2. 13,000 cu. yds.
RESERVES:	(Could be extended W and S to S only if overburden can be handled.) Very small because of steep nature of ground and overlying slates.
RECOMMENDATION:	The area be abandoned as a future quarry site.
REMARKS:	Out of sight of Adelaide.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	13th January, 1957.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME:	Glen Osmond Quarries. Northern Group.
OPERATOR:	Quarry Industries. Not operating at time of inspection. Agents - Quarry Industries Ltd.
LOCATION:	Section 1079, Hd. Adelaide.
ACCESS:	Fair, but needs improving near the quarry end. All the tracks on the north-east side need attention.
REFERENCE:	-
TITLE:	F.H. Hardy. Minerals - owner. Parts of section subject to leases and under leases by City Bricks Ltd. and Quarries Limited.
GEOLOGY:	Massive and laminated quartzites overlain and underlain by phyllitic slates. Sediments belong to the Belair slates and quartzite group in the Sturtian Series in the Adelaide System rocks. They are of Pre Cambrian age. The quartzite is a fairly good quality stone.
DEVELOPMENT, PRODUCTION, PLANT:	1. East Quarry - production is estimated to have been about 43,000 cu. yds. 2. West Quarry - production is estimated to have been about 55,000 cu. yds. Total production from the quarries - 108,000 cu. yds.
RESERVES:	Reserves small because of the steep hill slope and overlying slates. Main highway out of Adelaide runs near the outcrop.
RECOMMENDATION:	No further work to be done at this juncture.
REMARKS:	Main highway about 100 yds. to north. Partly out of sight of Adelaide.
PHOTOS:	To be taken.
NOTED BY:	L. G. Nixon.
DATE:	14th January, 1957.
LOCALITY PLAN:	-

APPENDIX. Part IV.

NAME:	B. Cappers Quarry. (Glen Osmond Quarry area).
OPERATOR:	Stone Bros. Not operating now.
LOCATION:	Section 1079, Hd. Adelaide.
ACCESS:	Poor at present. Old tracks exist but need conditioning.
REFERENCE:	Geological Survey Bulletin 10, pp. 18-19.
TITLE:	F.A. Hardy. Subject to lease and under lease to City Bricks Ltd. and Quarries Ltd.
GEOLOGY:	Slates of the Belair Group formation in the Sturtian Series of the Adelaide System of Pre Cambrian age.
DEVELOPMENT, PRODUCTION, PLANT:	Estimated to have been about 14,000 cu. yds.
RESERVES:	Reserves at least as much as has already been quarried.
RECOMMENDATION:	No further quarrying operations be carried out. Nc further work at this stage.
REMARKS:	In view of Adelaide. This type of stone is no longer in demand.
PHOTOS:	-
NOTED BY:	L. G. Nixon.
DATE:	15th February, 1957.
LOCALITY PLAN:	-



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LEGEND

ESTIMATED RESERVES OVER 1 MILLION CUBIC YARDS ..... ⓪

ESTIMATED RESERVES BETWEEN 1 HUNDRED THOUSAND AND 1 MILLION CUBIC YARDS ..... ①

STURTIAN SERIES ..... Ps.

TORRENSIAN SERIES stonyfell quartzite ..... Ps.

MARINOAN SERIES ..... Pm.

RECENT { Talus outwash ..... Qrt. / Alluvial clays ..... Qrm.

AREA COVERED BY ..... BY

To accompany report by L.G. Nixon Geologist

S.A. DEPARTMENT OF MINES

Associated Drawing	No.	No.	Amendment	Exd.	Date

Req. No.
D.M.
Compiled from

LOCALITY PLAN OF SOME ALTERNATIVE QUARRY SITES
ADELAIDE HILLS AREA

Approved	Passed		
		Drn.	Scale 1 INCH TO 1 MILE
		Tcd. A.O.W.	57-86
		Ckd.	Ha 6/7+9
Director of Mines		Exd.	Date 26.2.57