Whisky Swamp Sand Deposit site inspection, 2008

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ABSTRACT

Construction sand products were produced from the Whisky Swamp sand deposit between 1985 and 2003. The occurrence appears to be a Tertiary stream sediment deposit that has been covered by Quaternary to Recent sediments. The extent of the deposit is unknown and detailed exploration is required to determine the size of the remaining resource. There is potential for similar sand deposits in the area.

INTRODUCTION

Following a dispute over tenure the Regulation and Rehabilitation Branch requested the Geological Survey Branch to provide geological and resource information on the Whisky Swamp Sand Deposit. The author and Jim Safta (Technical Assistant) conducted a brief inspection of the site on the 11 September, 2007.

LOCATION

The deposit (Mindep No. 8216) is located approximately 30 km north of Woomera and 10 km west of the sealed Olympic Highway that runs between Woomera and Roxby Downs (Fig. 1). The access track from the Olympic Highway to the mine site had suffered significant water erosion at several locations at the time of inspection and access was difficult.

The deposit lies on pastoral leasehold land of Purple Downs Station, held by BHP Billiton Pty Ltd, and within the Woomera Prohibited Area.

TENURE

Extractive Minerals Lease (EML) 5215, of 37.5 hectares, located in the Whisky Swamp area, in block 859, Out of Hundreds (Andamooka), was granted on 13 April, 1984 to James Baker Monfries for the recovery of sand (Fig. 1). The EML expired on 12 April, 2005 and no application for renewal was received by the due date. However after the expiry date, Mr Monfries indicated that he wished to regain ownership of the EML.

To allow time for a site inspection the Mining Registrar gazetted an area of the expired EML pursuant to section 15 of the *Mining Act, 1971*, on 5 October, 2006.

Pursuant to section 15(7) of the Act, it was advised that applications for mining tenements may not be received or considered in respect to the land described in the notice until the completion date of 4 October, 2007.

Pursuant to section 15(5) it was also advised that the Minerals and Energy Resources Division of Primary Industries and Resources SA, will undertake geoscientific investigations over the expired EML area.

Ken Lamb, director of Ernie Pty Ltd, had shown an interest in pegging the site of the expired EML and on 13 October, 2006 pegged Mineral Claim (MC) 3678 surrounding the gazetted exclusion area.

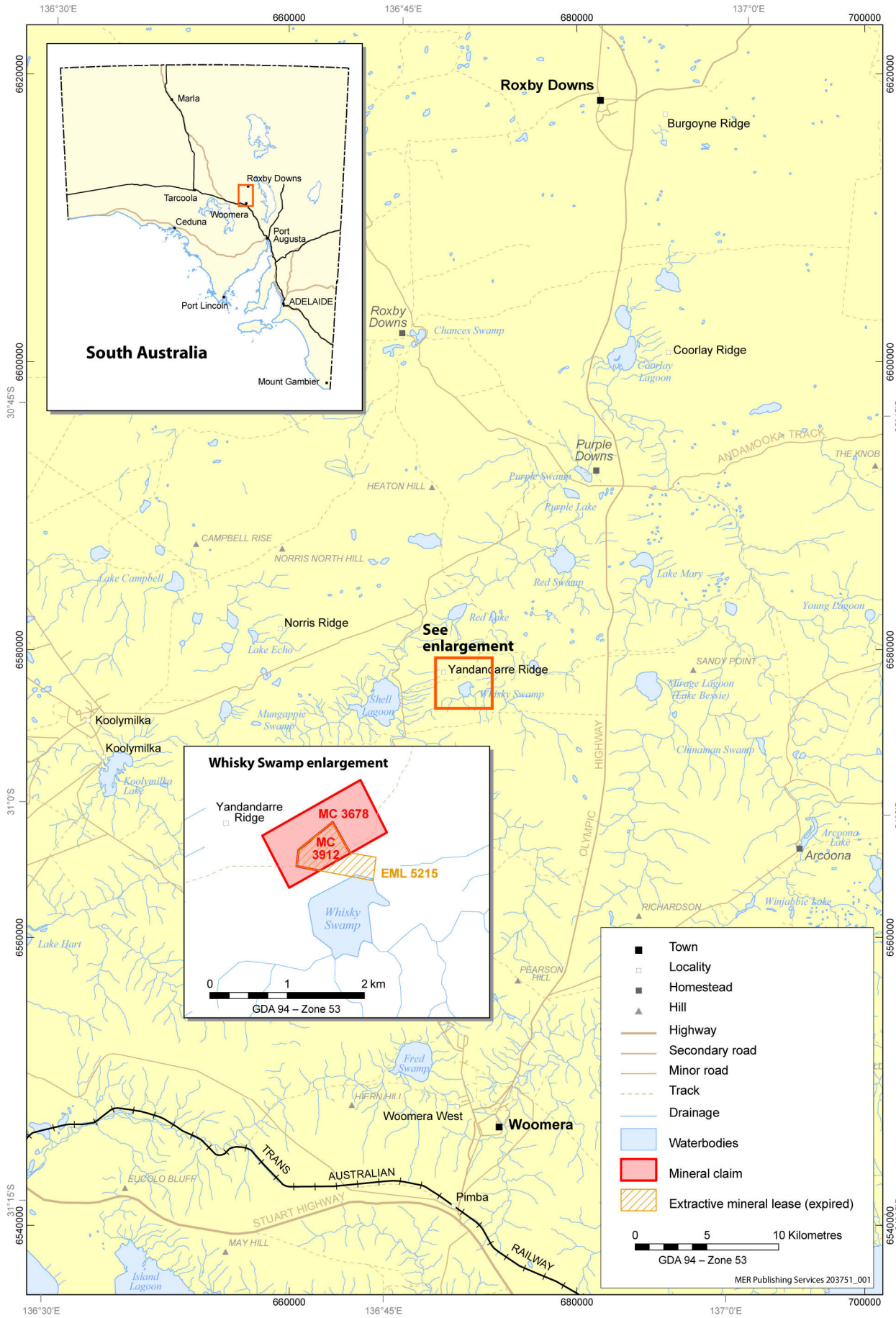

Figure 1. Location of Whisky Swamp Sand Deposit

On the 17 October, 2007, MC 3912 was granted to Ernie Pty Ltd over the gazetted exclusion area that expired on 4 October, 2007.

MINE SITE AND PRODUCTION

PIRSA records indicate that, between 1985 and 2003, 64 994 tonne of sand, was produced. The bulk of production was between 1985 and 1993 with intermittent production after this time. The sand produced was mainly for concrete use but other sand products included packing/filling, concrete block, gravel, bricklaying and filter sands (Appendix A).

The mine site consists of an open pit approximately 180 m x 90 m and 3–4 m deep that trends northeasterly (Fig. 2) with a treatment plant comprising mills, screens and elevators in the floor (Plate 1). The last worked area appears to be a 30 m x 30 m cut at the northeastern end of the main pit. A workshop, shipping containers and generator are located on the edge of the main pit and a camp site is situated 160 m to the southeast.

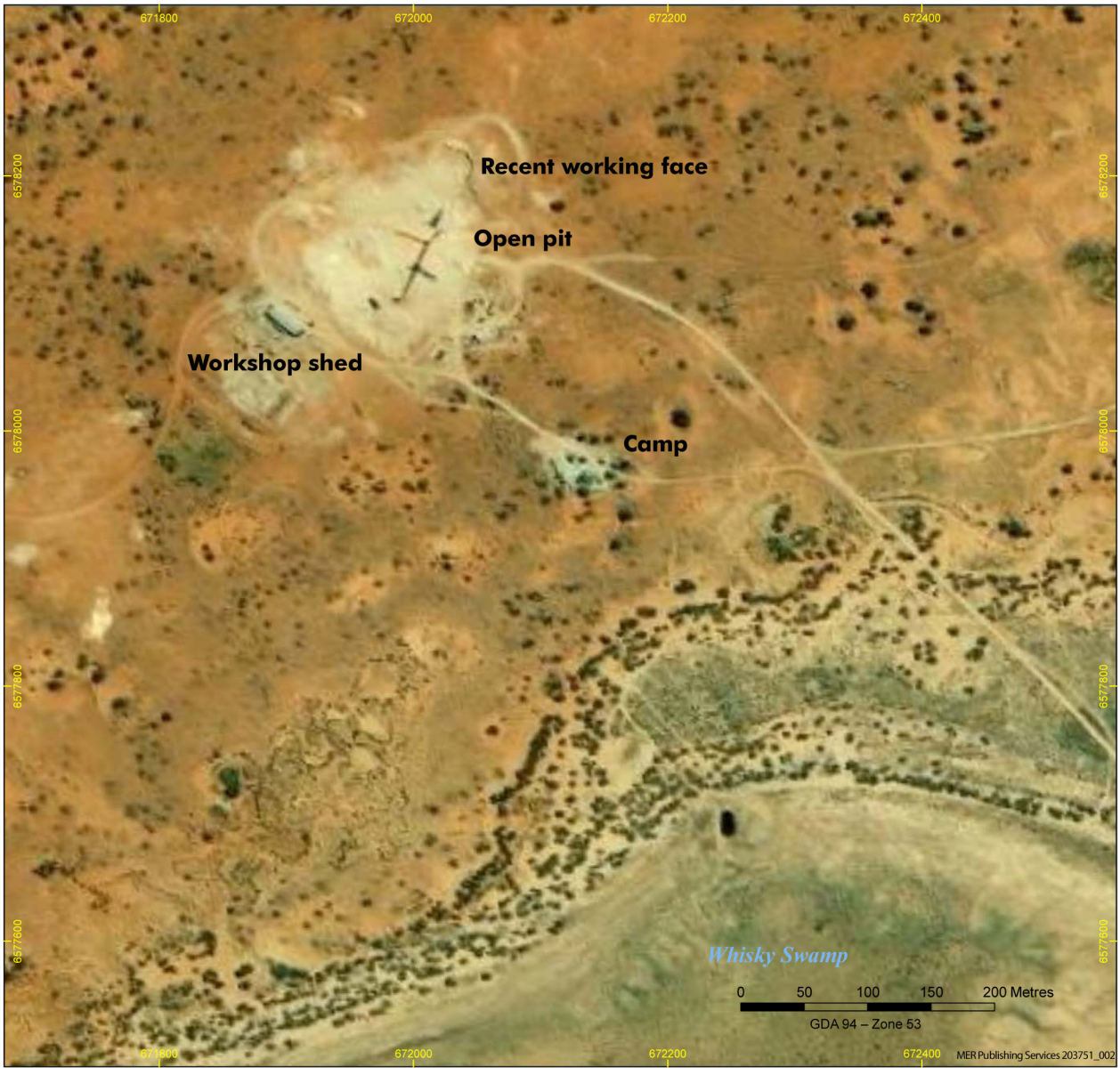

Figure 2. Site plan of Whisky Swamp Sand Deposit

Plate 1. Whisky Swamp Sand Deposit, view to northeast from floor of open pit. Recent working face at far end of open pit. (Photo 407415)

The treatment plant appears to have produced three main construction sand products (Plate 2):

- A product of granules to small pebbles in the 3–5 mm size range and comprising predominantly milky quartz grains.
- A product of granules in the 2–4 mm size range and comprising both milky and glassy quartz grains.
- A product of very course sand in the 1–2 mm size range and comprising predominantly glassy quartz grains.

Plate 2. Whisky Swamp sand products, coarsest at left (1 cm scale). (Photo 407416)

GEOLOGY

The 3–4 m high working face at the north-eastern end of the open pit comprises unconsolidated, horizontally layered, sub-rounded to well rounded quartz grains and minor lithic grains, from

1–5 mm in size with a buff coloured clay-silt matrix. Approximately 80% of the material is courser than 2 mm. The deposit is covered by about one metre of Quaternary to Recent sediments comprising dune sand over red brown clay-silt soil with friable calcrete developed at the base of the soil and the top of the deposit (Plate 3).

Plate 3. Recent working face, north-eastern end of open cut. (Photo 407417)

The sand deposit appears to be a Tertiary stream sediment and similar material has been excavated from a site near Mungappie Creek about 24 km west-southwest of Whisky Swamp. The ANDAMOOKA 1:250 000 geological map sheet shows several Tertiary occurrences in the region described as lake and stream deposits comprising conglomerates, grits and sandstones (Johns et al., 1966).

Two channel samples were collected from the working face, one from the eastern side (R1587835) and the other from the western side (R1587836). Each sample was examined petrologically and subjected to sieve analysis to determine particle size distribution and these results are presented in Appendix B.

CONCLUSIONS

The size and distribution of the Whisky Swamp sand deposit is unknown due to sedimentary cover and it is considered that auger drilling and/or back-hoe exploration is required to determine the extent of the resource.

The sand deposit is suitable for construction sand purposes and with future building development likely at Roxby Downs, Woomera and Andamooka the deposit may represent an important resource for the area.

It is considered likely that similar construction sand deposits may exist in the region and a geological assessment of the region is recommended.

APPENDIXES

1. Whisky Swamp Sand Production Figures

2. (A) Pontifex and Associates Pty Ltd Petrological Report 9215.
(B) Particle Size Distribution Results.

1. WHISKY SWAMP SAND PRODUCTION FIGURES

Whisky Swamp sand production

Year	Tonnes	Value ($)
1985/06	250	–
1986/06	80	400
1986/12	1 130	–
1987/06	8 350	60 186
1987/12	21 705	149 764
1988/06	5 200	75 813
1988/12	5 010	73 597
1990/12	6 174	70 633
1991/06	1 315	13 355
1991/12	4 728	61 464
1992/06	1 188	15 444
1993/06	111	750
1996/12	110	999
1998/06	500	2 000
1999/06	400	3 200
1999/12	7 200	70 000
2000/06	700	5 600
2001/12	20	40
2002/06	300	5 000
2002/12	450	3 600
2003/06	100	800
TOTAL	**64 994**	**$612 645**

Whisky Swamp sand products

Product	Washed	Dry Screened	Untreated	Total
Concrete	12 538	2 008	38 437	52 983
Pack/fill	808	660	7 638	9 106
Concrete block	–	450	–	450
Gravel	302	20	1 743	2 065
Bricklaying	40	323	–	363
Filter	27	–	–	27
TOTAL (tonnes)	**13 715**	**3 461**	**47 818**	**64 994**

2. (A) PONTIFEX AND ASSOCIATES PTY LTD PETROLOGICAL REPORT 9215.

SAMPLE: R1587835

LITHOLOGY: Unconsolidated, unsorted and heterogeneous, coarse to very coarse sand, with grains, granules and small pebbles of quartz. Accessory mixed clay, quartz ± carbonate and unidentified grains/crystals (with indeterminate relationship to the quartz grains but possibly contamination). Quartz commonly stressed. Basically the same as R1587836 described below.

Field note: *Whisky Swamp, East Face*

PETROGRAPHY:
This sample consists largely of unsorted but mostly coarse, subrounded to rounded grains, granules and small pebbles of quartz, 2–5 mm in diameter. One elongate granule is composed of deformed coarse-grained polycrystalline quartz and there are also granules of cherty possible low-temperature hydrothermal quartz, one of which has an internal quartz vein.

Accessory small clusters of brown clay (limonite-stained kaolinite or halloysite) are scattered through the epoxy mount but the relationship of these to the essentially independent quartz grains is indeterminate. One chip has relatively small quartz grains cemented by carbonate and an unidentified mineral that occurs as elongate lozenge-shaped grains. Internal fabric within some of the coarse polycrystalline quartz grains indicates inherent stress.

SAMPLE: R1587836

LITHOLOGY: Unconsolidated unsorted and heterogeneous coarse to very coarse quartz sand composed of rounded to subrounded grains, granules and small pebbles of quartz. Essentially the same as sample R1587835 described above, including stressed quartz.

Field note: *Whisky Swamp West Face*

PETROLOGY:
This material is seen in the epoxy mount to be dominated by rounded to subrounded grains, granules and small pebbles of quartz 2–5 mm in diameter. A few of these internally consist of relatively fine-grained mosaic of micro-granular and columnar vein-quartz, and there are also granules of cherty or low-temperature hydrothermal quartz, one of which has an internal quartz veinlet. Another chip has a patch of very fine-grained quartz enclosed in coarser quartz. Internal fabric in some quartz grains indicates incipient recrystallisation/stress (even protomylonitic micro-texture). (The clay-rich contaminants seen in similar sample R1587835 do not occur in this section).

(B) PARTICLE SIZE DISTRIBUTION RESULTS.

Whisky Swamp Samples, Particle Size Distributions

	Percent passing	
Sieve size (mm)	**R1587835 East Face**	**R1587836 West Face**
9.5	100	100
4.75	98	94
2.36	51	36
1.18	31	12
0.600	25	7
0.425	23	7
0.300	22	6
0.150	20	4
0.075	20	4
Fineness modulus	4.59	4.41

REFERENCES

Johns, R.K., Hiern, M.N. and Nixon, L.G., 1966. ANDAMOOKA map sheet. *South Australia Geological Survey. Geological Atlas, 1:250 000 Series,* sheet SH53-12.