# Southern Coal Holdings Pty Ltd

***Annual Report on Exploration Licence 4671***

***Talacootra***

***For the Period 21st February 2011 to 20th February 2012***

***by***

***Gary J. Jones***

***September 2012***

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| MINERAL PROVINCE: | Eucla Basin, Gawler Craton |
| COMODITIES: | Coal, Lignite, Potash |
| KEY WORDS: | Lignite, potash, drilling |

## *Summary*

Exploration by SCH on EL 4671 Talacootra during the first year of the tenure has been carried out in conjunction with the adjoining EL 4631 Pidinga and has focused on the previously known lignite deposits and more recently on the potash potential of alunite bearing clays in the vicinity of Lake Ifould

Previous exploration by several companies in this general locality during the 1970's and 1980's was primarily for uranium with lesser exploration effort directed towards the lignite and heavy mineral sands.

SCH has planned a modest program of slimline vertical aircore holes for the Pidinga area. This drilling is designed to follow up potash intersections made in SA Mines Department drilling as far back as 1948. The considerable documentation required in order to gain approvals for access to this sensitive area for exploration has been submitted. Significant delays have been experienced in gaining clearance by native title claimant groups. Future exploration for EL 4671 will largely depend on the results emerging from the Pidinga drilling.

Expenditure on EL 4671 for the year ended 20th February 2012 was $783.01.

# *1. Introduction*

Southern Coal Holdings Pty Ltd ("SCH") is the operator for Exploration Licence 4671, Talacootra. The project area is centred approximately 215 kilometres north west of Ceduna, in the Eucla Basin and south western portion of the Gawler Craton. The licence covers an area of 144 square kilometres.

The project area was selected to in order to explore for coal and lignite deposits, in an area where several intersections of lignite had been made in drill holes by previous explorers.

SCH considers the combined Talacootra - Pidinga project area is prospective for coal and lignite deposits as well as near-surface potash deposits. Alunite bearing clays in the vicinity of Lake Ifould contain significant levels of potash. Alunite is also a prominent alteration mineral associated with high sulphidation epithermal gold deposits.

# 2. Location and Access

## 2.1 Location and Access

The Talacootra project is situated in southern South Australia approximately 215 kilometres north west of Ceduna as shown in Figure 1. The project area comprises EL 4671 Talacootra and covers an area of approximately 144 square kilometres. The sealed Eyre Highway is approximately 65 kilometres to the south and the Transcontinental railway line is approximately 20 kilometres to the north. Access to the project area is via the Eyre Highway, thence the Illuka Jacinth-Ambrosia haul road and then along existing tracks. The area is covered by the 1:250,000 Map Sheet Barton SH-5-09 and 1:100,000 map sheets Moondrah 5236 and Pidinga 5336.

## 2.2 Physiography and Land Use

The topography of the project area is largely flat to undulating and ranges in altitude from around 148m asl in the south-east to 107m asl in the north. There is no permanent surface water in the area however ephemeral creeks drain into numerous small to medium sized salt lakes the most notable being lakes Pidinga and Ifould.

The Talacootra project area is located predominantly within the Yellabinna subregion of the Great Victoria Desert IBRA bioregion, but is also at the boundary of the Yalata and Nullarbor Plain subregions. The Yellabinna subregion supports a series of parallel sand dunes, while the Yalata sub-region to the south of the Pidinga area consists of aeolian sand dunes. The south-east extension of the dune fields of the Great Victorian Desert (GVD) flank the flat plain of the Nullarbor and includes the Ooldea Range, which lies to the east of the Pidinga project and trends north-west to south-west. The Ooldea Range is comprised of a serious of linear, longitudinal dunes formed from an ancient shoreline that are constructed largely of quartz sand.

The main land use of the area is conservation and Aboriginal land use, as well as mineral exploration, and limited tourism. The lack of access, water and general isolation of areas within the Yellabinna Regional Reserve, such as the Pidinga area, has contributed to the lack of visitation and pastoral development within the area.

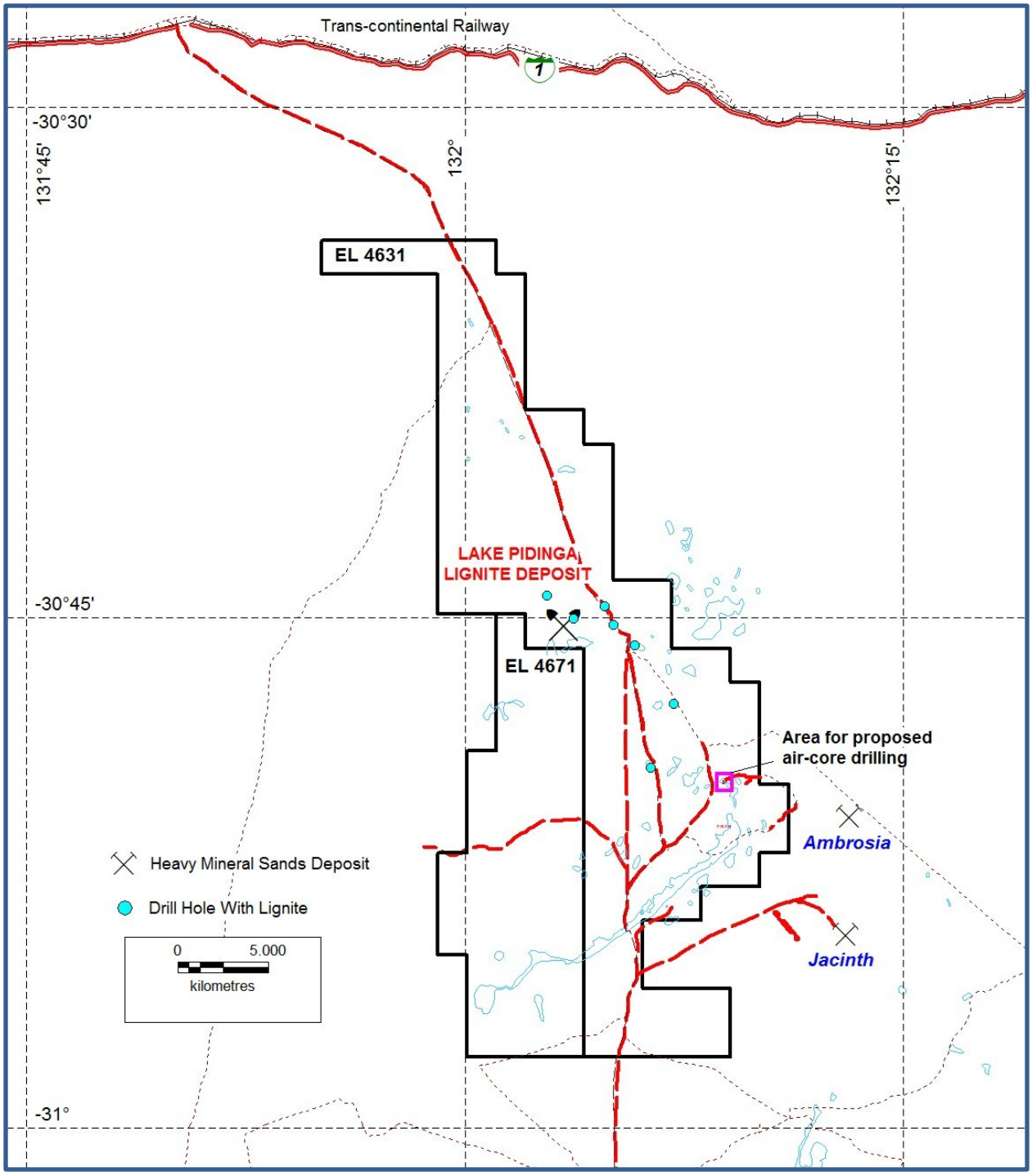


***Figure 1.*** *EL 4671 Talacootra Locality Diagram.*

### 2.3 Climate

The Talacootra area has a mediterranean type climate with hot, dry summers and cool, wet winters. July is the wettest month. The average yearly precipitation is just under 300mm at the coast and diminishes northward into the interior, becoming increasingly semi-arid. The Goyder's Line, which demarcates the edge of the area where rainfall is generally sufficient to support agriculture, starts near Ceduna.

## *3. Tenure*

### 3.1 Tenement Details

Exploration Licence 4671 covers an area of 144 square kilometres. The tenement lies wholly within the boundaries of the Yellabinna Regional Reserve. EL 4671 was granted to Southern Coal Holdings Pty Ltd a wholly owned subsidiary of WPG Resources Ltd ("WPG") on the 21$^{st}$ of February 2011 and is current to 20$^{th}$ of February 2013.

### 3.2 Landowners

EL 4671 lies within the area covered by the Alinytjara Wilurara Natural Resources Management (NRM) Board, which covers 26% of the State. The area is within the Great Victorian Desert Environmental Region, and the Yellabinna Environmental Association

Throughout the region, there is a high degree of cultural connection to Aboriginal Lands and traditional ownership is recognised. The Far West Coastal Group, representing the Mirning, Wirangu, Maralinga Tjarutja, Yalata and Yabi Dinah groups, are the native title claimants within the project area. The Claim is registered with the National Native Title Tribunal. In particular, formal Aboriginal Lands closest to the project area includes the Yalata Lands (approximately 4600 km$^2$) and the Maralinga Lands (approximately 100 000 km$^2$). Several Aboriginal communities exist within these Aboriginal Lands and utilise the Yalata and Maralinga Lands.

The Yalata Aboriginal Lands are protected under the *Aboriginal Lands Trust Act 1966*, which vests inalienable freehold title in the Aboriginal Lands Trusts (ALT) and makes the ALT the 'landowner'. It is ALT policy to lease the land it owns to the appropriate Aboriginal community and family organisations and the Yalata Lands are leased back to the Yalata community at the local level. The ALT Board includes representatives from the various Aboriginal communities located on ALT Lands. The Yalata community township now comprises about 160 people.

The Maralinga Tjarutja Aboriginal Lands (MT Lands) lie further north of the Yalata Lands. *Maralinga Tjarutja Land Rights Act 1984* vests the land in MT under inalienable freehold title. The members of Maralinga Tjarutja Council are elected members from the community. The population of the MT Lands consists of about 100 people in 20 families, including staff based at the Oak Valley community. Oak Valley is now the population centre of the MT Lands and the number of people in the community rises significantly during cultural activities. There is regular movement of people between Ceduna, Yalata, Oak Valley, and other communities in the Region

## 3.3 Aboriginal Heritage Clearance

Native Title Mining Agreements for Exploration with the variously affected Native Title Claimant Groups are currently in the process of being negotiated. Two work clearance site visits have been carried out at the Pidinga prospect however no decision as to whether the drilling can proceed has yet been forthcoming.

## *4. Regional Geology*

The Talacootra project area is located on the eastern margin of the Eucla Basin. The Eucla Basin extends from Balladonia in Western Australia to east of Ooldea in South Australia.

Paleoproterozoic basement rocks comprise banded acid, intermediate and basic gneiss and schist and some granite all cut by pegmatite and quartz veins and are correlated with the Cleve Metamorphic suite of the Lincoln Complex. Outcrops are present along the north-western shore of Lake Ifould and occasionally within the lake bed itself.

The basement rocks are overlain by the Eocene Pidinga Formation sediments which includes sand, minor shales, lignitic clays and clayey lignites. The formation was deposited in a non-marine environment with the exception of the uppermost units that show evidence of the onset of a major mid-Eocence marine transgression. A sandy unit at the top of the Pidinga Formation may be Hampton Sandstone identified in previous drill holes and elsewhere in the Eucla Basin.

The Nullabor Limestone of Miocene age unconformably overlies the Pidinga Formation and wedges out against the Precambrian basement approximately 15 kilometres to the north east and east of Chundie Swamp. This is a hard crystalline fossiliferous limestone that forms a cap over the underlying sediments. The top of the Nullabor Limestone marks the end of Tertiary marine deposition period..

A thin veneer of Quarternary sediments that comprise alluvium, sand dunes, sandy and calcareous soil and lake deposits blankets the eastern side of the Eucla Basin. A regional geological map is shown in Figure 2.

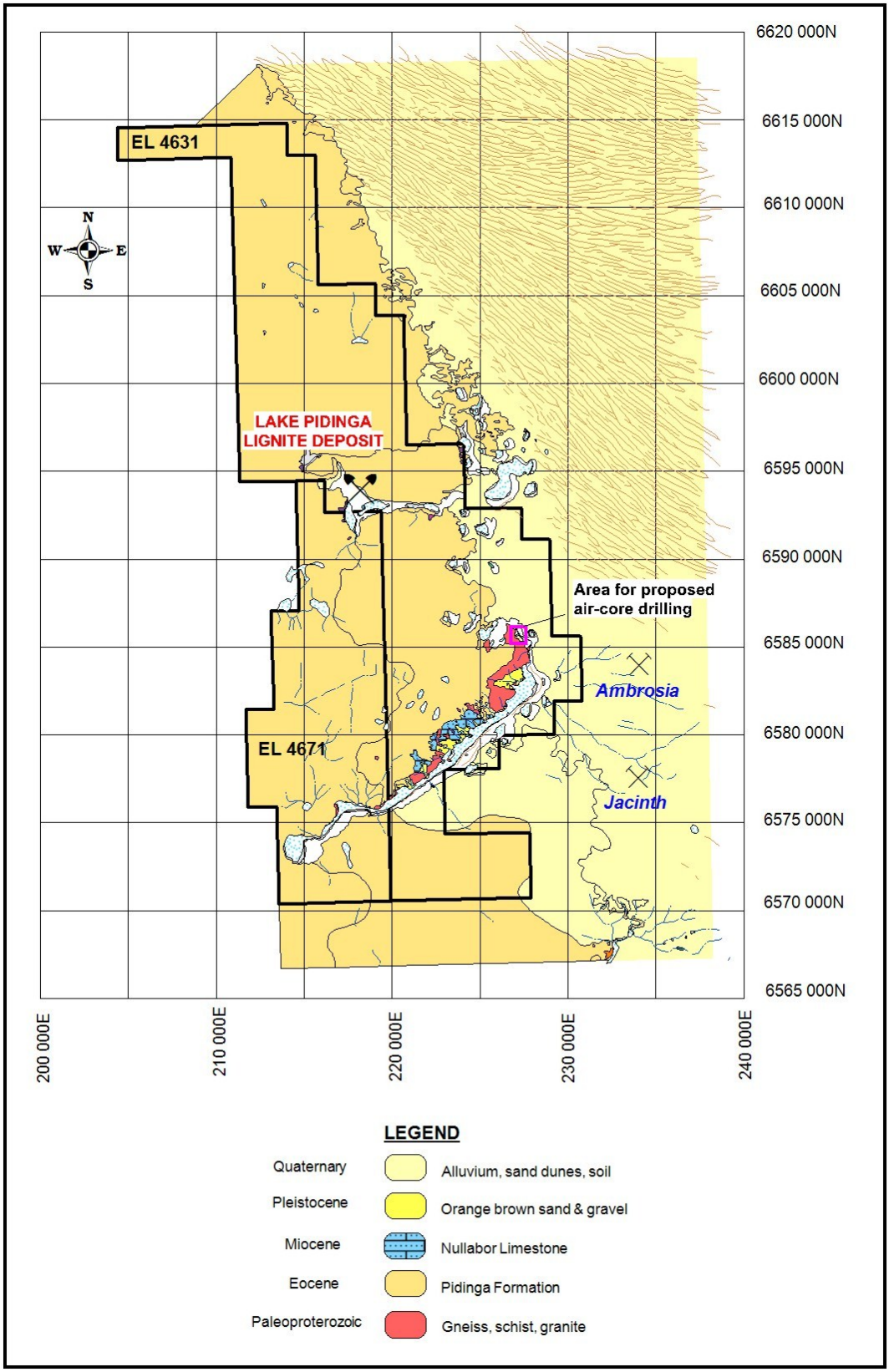


***Figure 2.*** *Talacootra EL 4671 Regional Geology*

# 5. *Work Completed* *(no field work)*

## 5.1 Literature Review

During the reporting period Southern Coal Holdings Pty Ltd (SCH) completed a full and detailed literature review and assessment of all the previous exploration including the drilling of 129 holes within the area covered by the current adjoin tenements. Results of this study have shown that although intersections of lignite were made in 57 of these holes the potential for a significant deposit of lignite is limited. Results of the literature review are summarised below.

**Env 00869 Mines Administration Pty Ltd. 1968**

A drilling program of eight holes aggregating 284 feet (86.6 metres) was carried out to determine the quantity and composition of the brines in the Talacootra - Pidinga lake systems with particular reference to the occurrence of potash or other valuable dissolved salts. The drilling indicated that the most extensive deposits of alunitic clay occurred in Lake C and that water bearing lake sediments were confined to Lake C and a narrow strip of the Main Lake. The total volume of brine present was therefore considered to be very limited.

**Env 01200 Australasian Mining Corp. Ltd. 1970**

Preliminary field reconnaissance in the Pidinga Lake – Lake Talacootra – Red Lake – Seven Mile Swamps area revealed significantly high radioactivity that was found to be restricted to minor discontinuous outcrops and minor near surface sample intervals in auger holes drilled in saline lagoons. Follow up work comprised a series of ground and airborne traverses with a hand held scintillometer and later a more comprehensive airborne radiometric survey. Anomalies were tested with a total of 97 holes for an aggregate 11,392 feet (3,742 metres). Minor low grade uranium mineralisation was located in basal conglomerates and in some lignite intervals. Alunitic clay was logged from eleven of the drill holes.

**Env 01316 Australasian Mining Corp. Ltd. 1970**

Exploration was carried out in conjunction with that reported in Env01200. Highest radioactivity was recorded from lignite beds north and west of Pidinga Lake. Thirty six holes for 3,649 feet (1,112 metres) were drilled in the lease area.

**Env 02169 Pechiney (Australia) Exploration Pty. Ltd. 1974**

EL 10. Airborne radiometric survey and rotary drilling in 43 holes for 1,677.9 metres testing radiometric anomalies. No results were reported.

**Env 02170 Pechiney (Australia) Exploration Pty. Ltd. 1974**

Exploration on EL 9 was carried out in conjunction with that on EL 10 and reported in Env02169. Rotary drilling in 29 holes for 1,432.4 metres testing radiometric anomalies. No results were reported.

**Env 02435 Pechiney (Australia) Exploration Pty. Ltd. 1974**

Final report for part of the area explored in EL 10 that was to be relinquished. Pechiney concluded that the uranium prospects on EL 10 appeared to be poor. Drilling had established the presence of weak radioactivity connected with clayey lignitic facies of the Pidinga Formation. The lignites were considered to have a limited lateral development and therefore it appeared unlikely that economic uranium concentrations would occur.

**Env 02504 Pechiney (Australia) Exploration Pty. Ltd. 1975 - 1976**

EL 164 covered the reduced part of EL 10. Exploration comprised track etch surveys, ground geological investigation of radiometric anomalies, soil rock and water sampling. Drilling comprised 10 holes for a total of 311 metres and all holes were down hole scintillometer probe logged. Neither drilling nor tack etch surveys gave encouraging results and the radiometric anomalies were attributed to radium and/or radon in the ground waters or to concentrations of uranium daughter products in the evaporates on the surface of the salt lakes.

**Env 03105 South Australia Department of Mines & Energy (SADME). 1977**

EL 281. Lignite and brown coal exploration that was carried out by SADME. Five holes were drilled at Pidinga but only two intersected lignitic sediments. The thickest seam was in Pidinga No.1 but samples recorded high ash contents that ranged from 55% to 75% on a dry basis. Overall it was concluded that the lignite occurred in small lenses and that reserves would be negligible. Added to that was the detraction of high ash content.

**Env 03829 Minoil Services Pty. Ltd. 1980**

EL 601. This tenement was taken up to investigate the potential of the known lignitic sediments as a carbon source for the liquefaction and/or carbon beneficiation process and covered the Pidinga lignite deposit. One hole was completed to a depth of 62.79 metres early in the life of the tenure and 14 further holes were later precollared but not deepened. Five of the pre-collar holes reached basement at shallow depths without intersecting lignitic material indicating the occurrence of lignitic sediments was not as widespread as was first thought.

**Env 03884 Minoil Services Pty. Ltd. 1981**

EL 625. This tenement was also taken up to investigate the potential of the known lignitic sediments as a carbon source for the liquefaction and/or carbon beneficiation process and covered the Talacootra lignite deposit. One hole was completed to a depth of 92.40 metres early in the life of the tenure and was followed by a further 7 holes that were completed and another 7 holes that were precollared but not deepened. Four of the completed holes encountered basement without cutting lignitic sediments.

**Env 06816 BHP Minerals Ltd. 1988**

EL 1353 was taken up to investigate the heavy mineral sands potential in the Ooldea Ridge. Initial field work involved the collection of stream samples. This was followed by the drilling of 55 shallow RC holes on three traverses for a total of 863.8 metres. Results indicated the presence

of minor zircon and ilmenite at the base of one of the units in holes OL68 and OL69 on Traverse 2. However the almost total lack of rutile, sub-economic quantities of zircon and ilmenite together with the depth to mineralisation and the fine grain size of the heavy minerals led BHP to conclude the area had no worthwhile potential.

## 5.2 Potash Investigations

Results of the SCH literature review, which included historical annual South Australian government mining reviews that date back to 1948, have highlighted the potential of the Talacootra - Pidinga area for the discovery of near-surface potash deposits. A summary of exploration carried out by the South Australian Mines Department exploration in the region in 1948 was published in a paper in Economic Geology in 1953 by D. King a government geologist. (Origin of Alunite Deposits at Pidinga, South Australia. Economic Geology v. 48, pp. 689-703). Maps showing the location of potash bearing drill holes at Lake 'C" were produced in the 1948 report by A. T. Armstrong (*Mining Review No. 89*) and are shown as Figures 3, 4 and 5.

Alunite is a common source of potash, a valuable fertiliser commodity. Alunite is also a common accessory alteration mineral associated with high sulphidation epithermal gold deposits.

## 5.3 Drill Program Planning

SCH considers the Talacootra - Pidinga area has the potential to host a significant potash deposit and has planned a modest program of shallow air-core drilling within the Pidinga tenement to test this target.

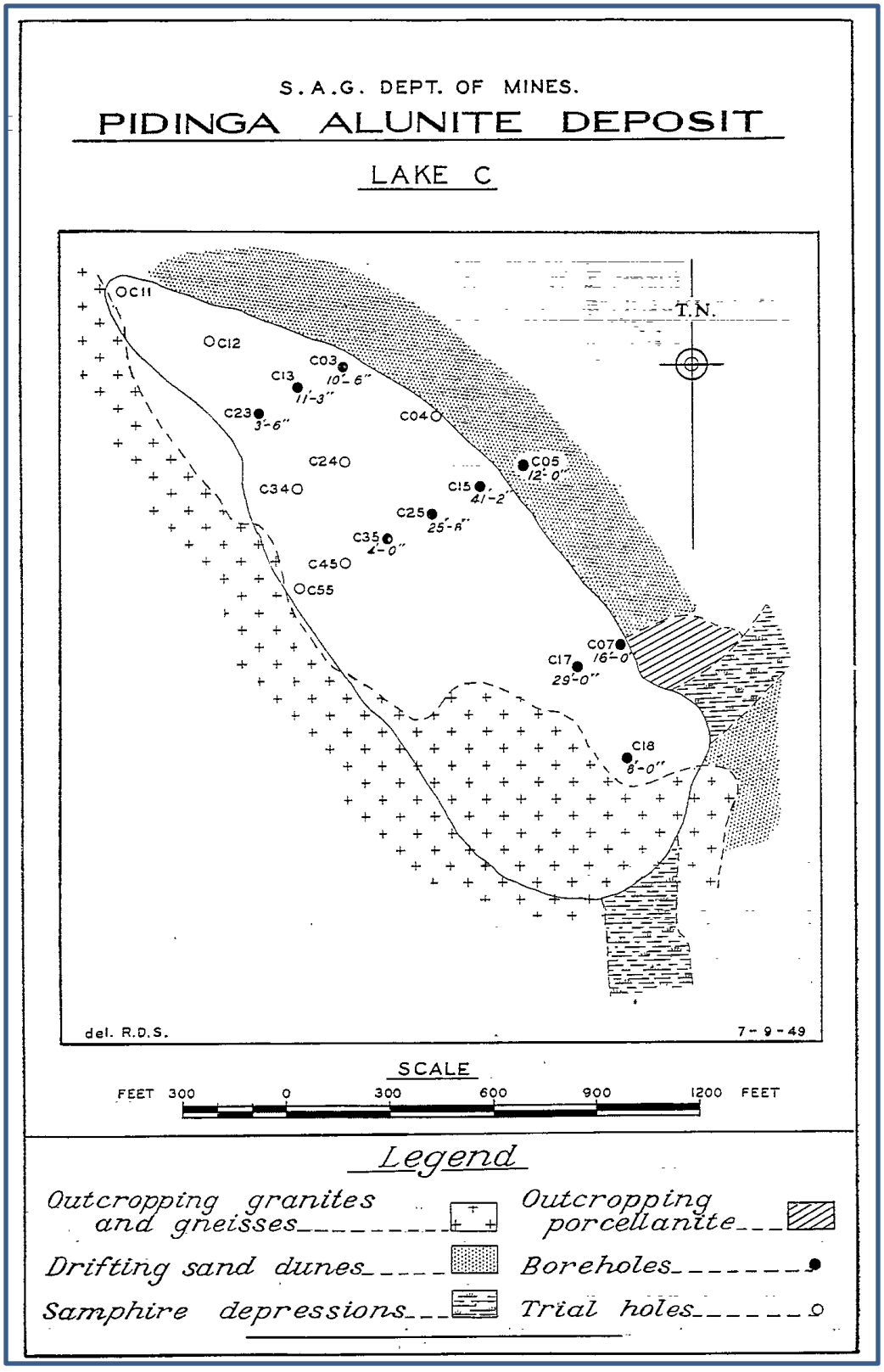


***Figure 3.*** *Pidinga Alunite Deposit. Map Prepared by A. T. Armstrong 1948.*

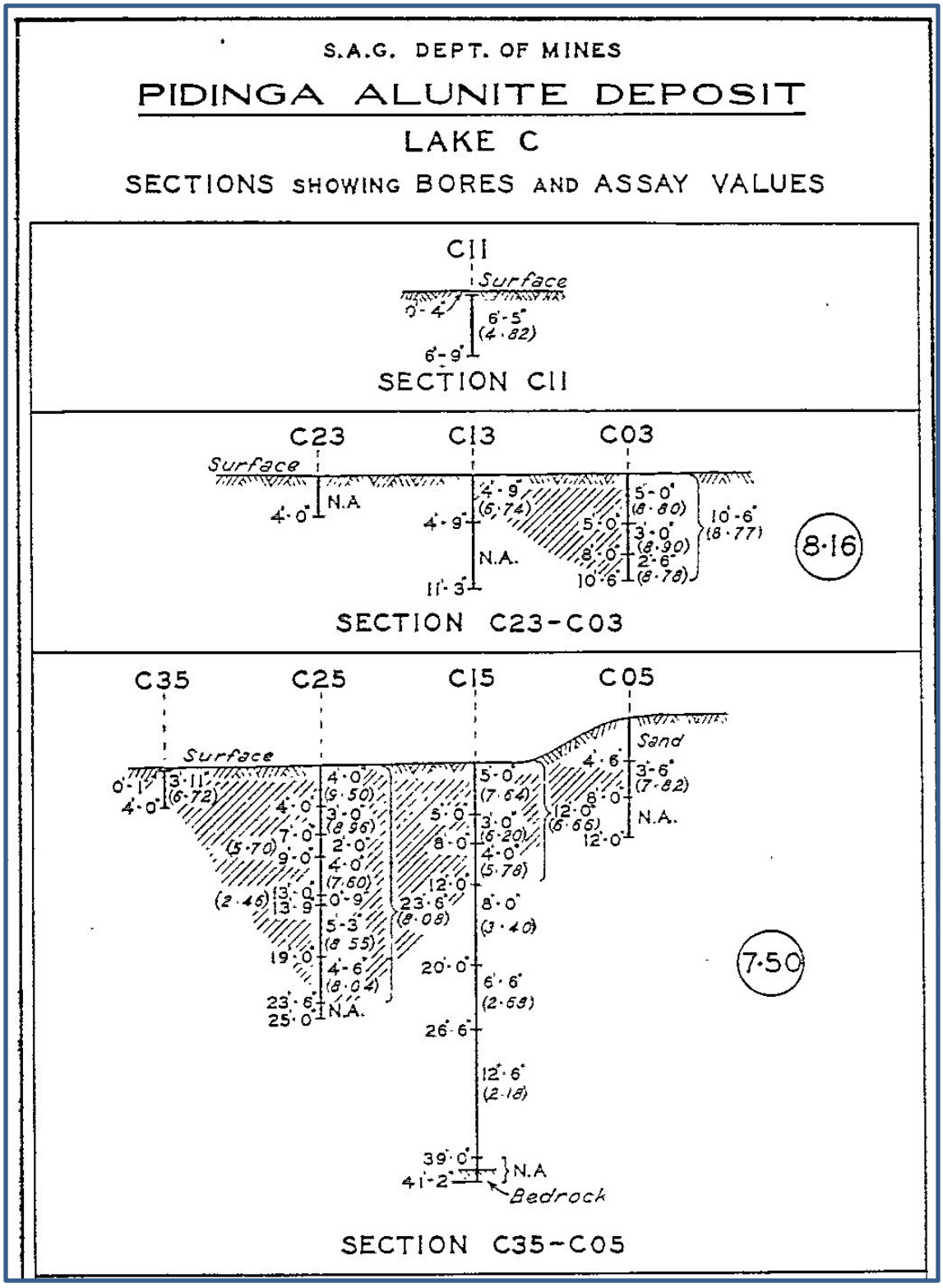


***Figure 4.*** *Pidinga Alunite Deposit. Drill Section Prepared by A. T. Armstrong 1948.*

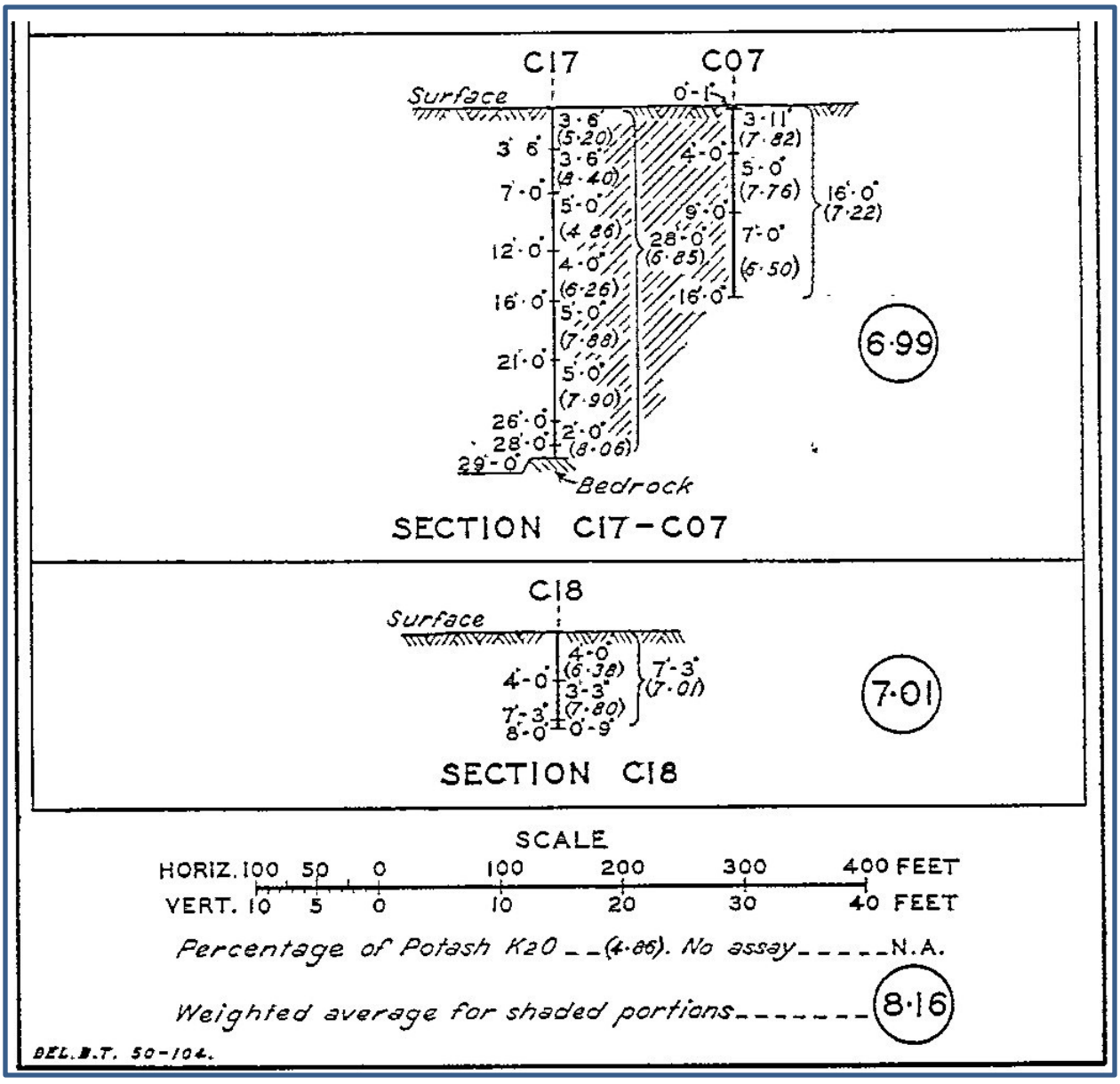


***Figure 5.*** *Pidinga Alunite Deposit. Drill Section Prepared by A. T. Armstrong 1948.*

## *6. Planned Future Work*

Future exploration in the Talacootra EL will be dependent on the results from the planned drilling program at Pidinga. In the event of a positive outcome work will be directed towards the location of additional deposits of alunite clay. This will involve detailed regional mapping in conjunction with hand-auger soil sampling and follow-up slim line aircore drilling.

## *7. Expenditure*

**Expenditure for EL 4671 for the Twelve Month Period Ending 20th February 2012**

| Category | $ |
|---|---|
| Consultants geological | 570.88 |
| Tenement expenses | 110.00 |
| Office costs | 102.13 |
| **Total** | **783.01** |

**Life to Date Expenditure for EL 4671**

| From | To | $ |
|---|---|---|
| 21 Feb 11 | 20 Feb 12 | 783.01 |
| **Total** | | **32,888** |

# Southern Coal Holdings Pty Ltd

***Final Annual Report on Exploration Licence 4671***

***Talacootra***

***For the Period 21st February 2012 to 20th February 2013***

***by***

***Gary J. Jones***

***April 2013***

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## *Summary*

Exploration by SCH on EL 4671 Talacootra during the two years of the tenure was designed to be carried out in conjunction with the adjoining EL 4631 Pidinga and was to be focused on the previously known lignite deposits and on the potash potential of alunite bearing clays in the vicinity of Lake Ifould

Open file literature reviews indicated that previous exploration by several companies in this general locality during the 1970's and 1980's was primarily for uranium with lesser exploration effort directed towards lignite and latterly heavy mineral sands.

SCH had planned a modest program of slimline vertical aircore holes for the project area. The initial drilling was planned for the adjoining Pidinga EL and designed to follow up potash intersections made in SA Mines Department drilling as far back as 1948. The considerable documentation required in order to gain approvals for access to this sensitive area for exploration were submitted during Year 1. However on-going significant delays were experienced in gaining clearance by native title claimant groups and as a result SCH decided to abandon the exploration drilling and relinquish both tenements.

Expenditure on EL 4671 for the year ended 20th February 2013 was $288.00 and for the term of the licence was $1,071.01.

# *1. Introduction*

Southern Coal Holdings Pty Ltd ("SCH") was the operator for Exploration Licence 4671, Talacootra. The project area is centered approximately 215 kilometres north west of Ceduna, in the Eucla Basin and south western portion of the Gawler Craton. The licence covered an area of 144 square kilometres.

The project area was selected to in order to explore for coal and lignite deposits, in an area where several intersections of lignite had been made in drill holes by previous explorers.

SCH considered the combined Talacootra - Pidinga project area was prospective for coal and lignite deposits as well as near-surface potash deposits. Alunite bearing clays in the vicinity of Lake Ifould contain significant levels of potash. Alunite is also a prominent alteration mineral associated with high sulphidation epithermal gold deposits.

# 2. Location and Access

## 2.1 Location and Access

The Talacootra project is situated in southern South Australia approximately 215 kilometres north west of Ceduna as shown in Figure 1. The project area comprises EL 4671 Talacootra and covers an area of approximately 144 square kilometres. The sealed Eyre Highway is approximately 65 kilometres to the south and the Transcontinental railway line is approximately 20 kilometres to the north. Access to the project area is via the Eyre Highway, thence the Illuka Jacinth-Ambrosia haul road and then along existing tracks. The area is covered by the 1:250,000 Map Sheet Barton SH-5-09 and 1:100,000 map sheets Moondrah 5236 and Pidinga 5336.

## 2.2 Physiography and Land Use

The topography of the project area is largely flat to undulating and ranges in altitude from around 148m asl in the south-east to 107m asl in the north. There is no permanent surface water in the area however ephemeral creeks drain into numerous small to medium sized salt lakes the most notable being lakes Pidinga and Ifould.

The Talacootra project area is located predominantly within the Yellabinna subregion of the Great Victoria Desert IBRA bioregion, but is also at the boundary of the Yalata and Nullarbor Plain subregions. The Yellabinna subregion supports a series of parallel sand dunes, while the Yalata sub-region to the south of the Pidinga area consists of aeolian sand dunes. The south-east extension of the dune fields of the Great Victorian Desert (GVD) flank the flat plain of the Nullarbor and includes the Ooldea Range, which lies to the east of the Pidinga project and trends north-west to south-west. The Ooldea Range is comprised of a serious of linear, longitudinal dunes formed from an ancient shoreline that are constructed largely of quartz sand.

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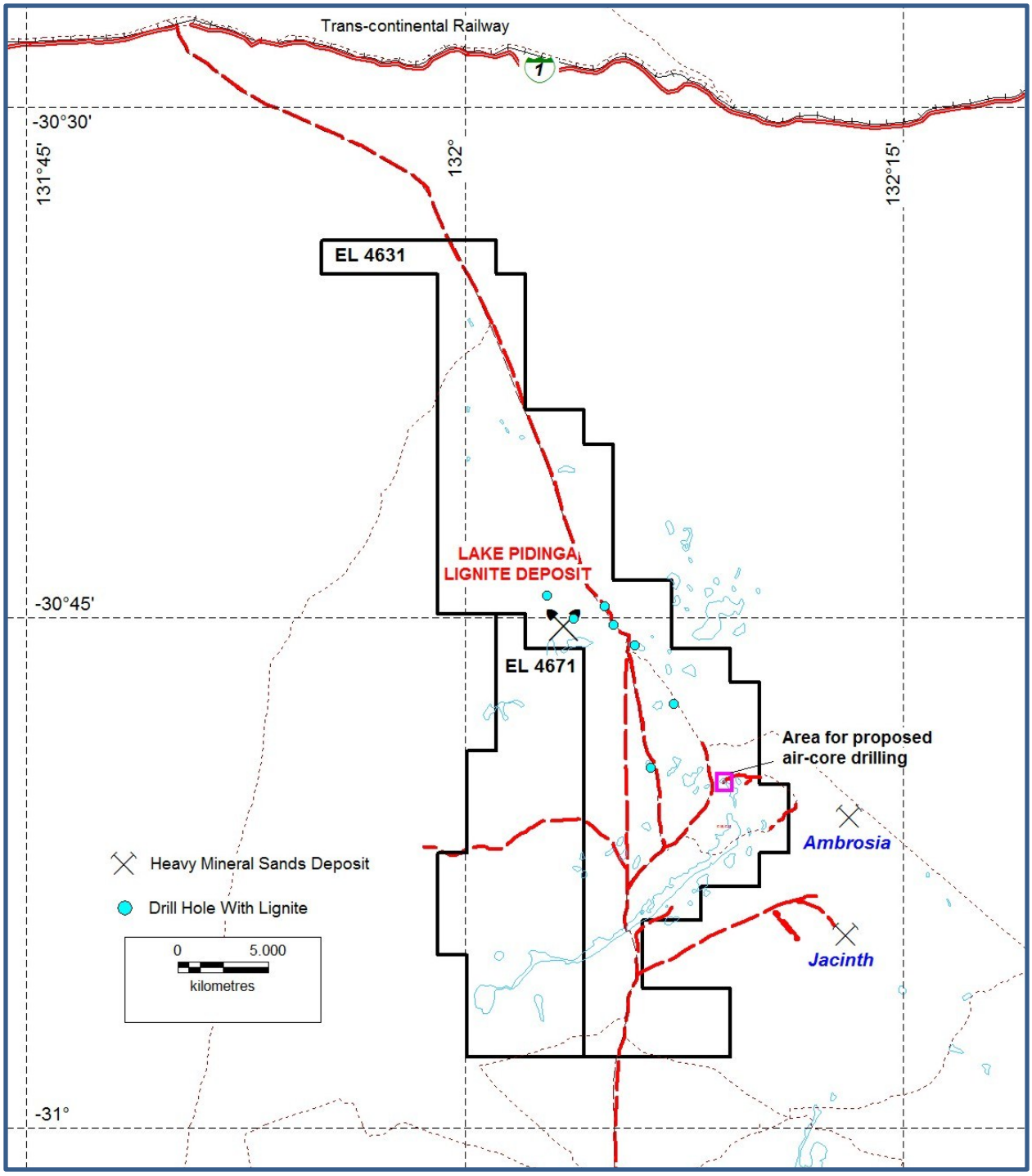


***Figure 1.*** *EL 4671 Talacootra Locality Diagram.*

### 2.3 Climate

The Talacootra area has a mediterranean type climate with hot, dry summers and cool, wet winters. July is the wettest month. The average yearly precipitation is just under 300mm at the coast and diminishes northward into the interior, becoming increasingly semi-arid. The Goyder's Line, which demarcates the edge of the area where rainfall is generally sufficient to support agriculture, starts near Ceduna.

## *3. Tenure*

### 3.1 Tenement Details

Exploration Licence 4671 covered an area of 144 square kilometres. The tenement was wholly within the boundaries of the Yellabinna Regional Reserve. EL 4671 was granted to Southern Coal Holdings Pty Ltd a wholly owned subsidiary of WPG Resources Ltd ("WPG") on the 21$^{st}$ of February 2011 and expired on the 20$^{th}$ of February 2013.

### 3.2 Landowners

EL 4671 was situated within the area covered by the Alinytjara Wilurara Natural Resources Management (NRM) Board, which covers 26% of the State. The area was within the Great Victorian Desert Environmental Region, and the Yellabinna Environmental Association

Throughout the region, there is a high degree of cultural connection to Aboriginal Lands and traditional ownership is recognised. The Far West Coastal Group, representing the Mirning, Wirangu, Maralinga Tjarutja, Yalata and Yabi Dinah groups, are the native title claimants within the project area. The Claim is registered with the National Native Title Tribunal. In particular, formal Aboriginal Lands closest to the project area includes the Yalata Lands (approximately 4600 km$^2$) and the Maralinga Lands (approximately 100 000 km$^2$). Several Aboriginal communities exist within these Aboriginal Lands and utilise the Yalata and Maralinga Lands.

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## 3.3 Aboriginal Heritage Clearance

Native Title Mining Agreements for Exploration with the variously affected Native Title Claimant Groups were sought during the term of the licence but were subjected to on-going unacceptable delays. A site clearance visit was conducted to EL4631 with representatives of the Far West Coast Traditional Lands Association on the 18th of April 2012, however since the Company was seeking to drill some of the holes in the dry lake bed the FWC requested another site visit with tribal elders as this issue was clearly sensitive. A further site visit was carried out by tribal elders without a SCH representative being present during the reporting period but again no agreement could be reached among the various tribal factions in regard to access for the proposed air-core drilling program.

## *4. Regional Geology*

The Talacootra project area is located on the eastern margin of the Eucla Basin. The Eucla Basin extends from Balladonia in Western Australia to east of Ooldea in South Australia.

Paleoproterozoic basement rocks comprise banded acid, intermediate and basic gneiss and schist and some granite all cut by pegmatite and quartz veins and are correlated with the Cleve Metamorphic suite of the Lincoln Complex. Outcrops are present along the north-western shore of Lake Ifould and occasionally within the lake bed itself.

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The Nullabor Limestone of Miocene age unconformably overlies the Pidinga Formation and wedges out against the Precambrian basement approximately 15 kilometres to the north east and east of Chundie Swamp. This is a hard crystalline fossiliferous limestone that forms a cap over the underlying sediments. The top of the Nullabor Limestone marks the end of Tertiary marine deposition period..

A thin veneer of Quarternary sediments that comprise alluvium, sand dunes, sandy and calcareous soil and lake deposits blankets the eastern side of the Eucla Basin. A regional geological map is shown in Figure 2.

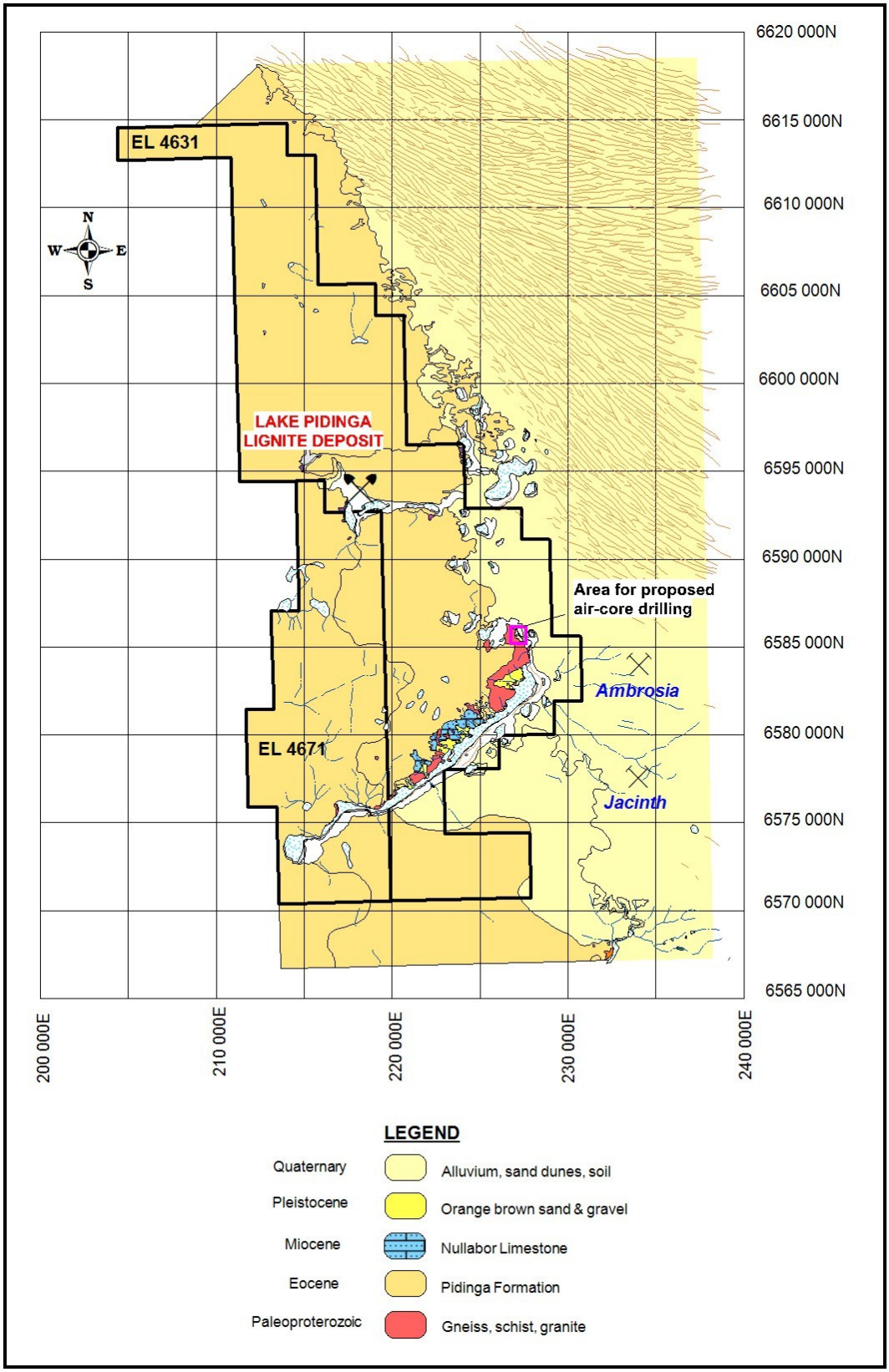


***Figure 2.*** *Talacootra EL 4671 Regional Geology*

# 5. Work Completed

## 5.1 Year 1

During the first year of the licence term SCH completed a full and detailed literature review and assessment of all the previous exploration including the drilling of 129 holes within the area covered by the current adjoining tenements. Results of this study showed that although intersections of lignite were made in 57 of these holes the potential for a significant deposit of lignite is limited. Detailed summaries were included in the First Annual Report.

The SCH literature review also included historical annual South Australian government mining reviews that date back to 1948. Mines Inspectors reports in some of these highlighted the potential of the Talacootra - Pidinga area for the discovery of near-surface potash deposits. A summary of exploration carried out by the South Australian Mines Department exploration in the region in 1948 was published in a paper in Economic Geology in 1953 by D. King a government geologist. (Origin of Alunite Deposits at Pidinga, South Australia. Economic Geology v. 48, pp. 689-703). Maps showing the location of potash bearing drill holes at Lake 'C" were produced in the 1948 report by A. T. Armstrong (*Mining Review No. 89*) and were included as Figures 3, 4 and 5 in the First Annual Report for EL 4671.(*Jones, G.J., 2012*)

Alunite is a common source of potash, a valuable fertiliser commodity. Alunite is also a common accessory alteration mineral associated with high sulphidation epithermal gold deposits.

A brief reconnaissance field visit was made to the project area to investigate outcrops of alunite bearing clays.

## 5.2 Year 2

No field work was carried out during the second year of the licence. Extensive negotiations for access with Native Title claimant groups that were ultimately unsuccessful was the only activity pertaining to the tenement.

## *6. Expenditure*

**Expenditure for EL 4671 for the Twelve Month Period Ending 20th February 2013**

| Category | $ |
|---|---|
| Legal Fees | 288.00 |
| **Total** | **288.00** |

**Total Expenditure for EL 4671**

| From | To | $ |
|---|---|---|
| 21 Feb 21011 | 20 Feb 2012 | 783.01 |
| 21 Feb 2012 | 20 Feb 2013 | 288.00 |
| **Total** | | **1071.01** |