Annual Review Sunnyside Coal Mine

Name of operation	Sunnyside Coal Mine
Name of operator	Whitehaven Coal Mining Pty Ltd
Development consent/project approval number	PA 06_0308
Name of holder of development consent/project approval	Namoi Mining Pty Ltd
Mining lease number	ML 1624
Name of holder of mining lease	Namoi Mining Pty Ltd
Water licence number	WAL 29537
Name of holder of water licence	Namoi Mining Pty Ltd
MOP start date	04-08-2017
MOP end date	14-08-2018
Annual review start date	01-12-2016
Annual review end date	31-12-2017

I, Jamie Frankcombe, certify that this audit report is a true and accurate record of the compliance status of Sunnyside Coal Mine for the period December 1st 2016 until November 30th 2017, and that I am authorised to make this statement on behalf of Namoi Mining Pty Ltd.

Note. a) The Annual Review is an 'environmental audit' for the purposes of section 122B (2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000.

b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or \$22,000, or both).

Jamie Frankcombe
Director- Whitehaver Coal Mining Utd
Ramale
12/02/2018

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1 STATEMENT OF COMPLIANCE

The compliance status of the Sunnyside Coal Mine as at 31st December 2017 is summarised in Table 1. Table 2 notes non-compliances that occurred during the reporting period, and non-compliances from previous reporting periods that still require management action.

Table 1 - Statement of Compliance

Were all conditions of the relevant approval(s) complied with?			
PA 06_0308 Consolidated No			
EPL 12957	No		
ML 1624	Yes		
WAL 29537	Yes		

Table 2 - Non-compliances

Relevant Approval	Schedule (Condition) Number	Condition Description (summary)	Compliance status	Comment	Where Addressed in Annual Review
PA 06_0308	2(2)	Carry out project generally in accordance.	Non-compliant	Refer following conditions.	n/a
PA 06_0308	3(20)	Requirement for continuous meteorological monitoring.	Non-compliant	Continuous monitoring was not achieved due to communication issues and breakdowns.	Section 11.2
EPL 12957	M2.1	Requirement to monitor concentration of pollutants discharged	Non-compliant	Deposited dust results for April destroyed at Laboratory.	Section 6.1.3, 11.2
EPL 12957	M4.1	Requirement for continuous meteorological monitoring.	Non-compliant	Continuous monitoring was not achieved due to communication issues and breakdowns.	Section 11.2

Note: Non-compliances identified within the Independent Environmental Audit undertaken during a previous reporting period are listed in Table 12.

Compliance status key for Table 2

Risk level	Colour code	Description
High	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium	Non-compliant	Non-compliance with: potential for serious environmental consequences, but is unlikely to occur; or potential for moderate environmental consequences, but is likely to occur
Low	Non-compliant	Non-compliance with: potential for moderate environmental consequences, but is unlikely to occur; or potential for low environmental consequences, but is likely to occur
Administrative non-compliance	Non-compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)

2 INTRODUCTION

This is the ninth Annual Review (AR), formerly Annual Environmental Management Report, produced for the Sunnyside Coal Mine (SCM), and it has been prepared in accordance with Conditions 4 and 5 of Mining Lease (ML 1624) (Mining Act 1992) and Condition 5 (Schedule 5) of PA 06_0308 (consolidated). The AR follows the format required by the NSW Government Annual Review Guideline (October, 2015).

Though primarily covering the period from 1st December 2016 to 31st December 2017 (the reporting period), where relevant the AR provides information on historical aspects of the operation and longer term trends in environmental monitoring results. This reporting period covers 13 months in order to bring the SCM reporting period to calendar year, as per PA 06_0308 (consolidated).

The Sunnyside Coal Mine is located within the Gunnedah Shire, approximately 15 km west of Gunnedah (Figure 1). The mine is owned by Namoi Mining Pty Ltd (NMPL) and operated by Whitehaven Coal Mining Pty Ltd. Both companies are wholly owned subsidiaries of Whitehaven Coal Limited (WCL).

On the 25th October 2012, Whitehaven announced that mining operations would be suspended at Sunnyside and the mine would be placed into a care and maintenance phase. Mining operations ceased in November 2012, with the remaining ROM coal stockpiled at site crushed and transported to the CHPP until stockpiles were exhausted in May 2013.

During the reporting period WCL confirmed its intention to recommence mining operations at the site, to mine the remaining coal reserves and then rehabilitate the site. Drilling began at SCM on 12th September 2017, with full operations recommencing on the 25th September 2017.

2.1 Mine Contacts

The management personnel responsible for operational and environmental performance at the SCM and their relevant contact details are as follows:

- Mr Craig Sullivan, Operations Superintendent and Manager Mining Engineering retains statutory responsibility for mining activities at the site. Contact: (02) 6741 9390
- Mr Nigel Wood, General Manager, Open Cut Operations oversees Open Cut Operations for the Whitehaven Group. Contact: (02) 6741 9309.

• Mrs Madeline Whitten, Environmental Officer – oversees day to day environmental and rehabilitation performance across the site. Contact: (02) 6740 7009

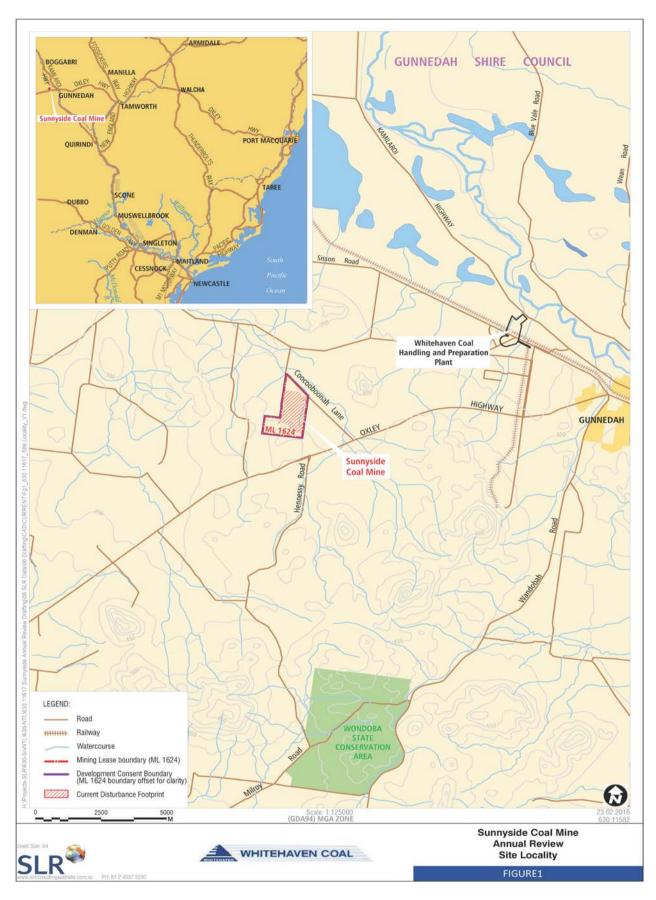


Figure 1 Locality Plan

3 APPROVALS

3.1 Tenements, Licences, and Approvals

Table 3 identifies the approvals in place for SCM at the end of the reporting period, the issuing / responsible Authority, dates of issue, expiry date and relevant comments.

Table 3 - Tenements, Licences and Approvals

Issuing / Responsible Authority	Type of Lease, Licence, Approval	Date of Issue	Expiry	Comments
Department of Planning and Environment (DP&E)	Planning and Approval (PA) Septembe Environment 06_0308 2008		5 th November 2020	PA modified December 2016 to update Annual Review period.
Environment Protection Authority (EPA)	Environment Protection Licence No. 12957	19 th September 2017	N/A	Update to reflect recommencement of operations
Division of Resources and Geoscience (DRG)	ML 1624	5 th November 2008	5 th November 2029	
Division of Resources and Geoscience	Mining Operations Plan (MOP)	4 th August 2017	14 th August 2018	Update to reflect recommencement of operations
Department of Primary Industry - Water	WAL 29537 (90WA822534) 90BL253767 90BL253768 90BL253769 90BL254686 90BL254687 90BL254688 90BL254689	27 th April 2009 9 th Feb 2007 9 th Feb 2007 9 th Feb 2007 26 th Mar 2008 26 th Mar 2008 26 th Mar 2008 26 th Mar 2008	17 th January 2025 Perpetuity Perpetuity Perpetuity Perpetuity Perpetuity Perpetuity Perpetuity Perpetuity Perpetuity	Mining Test Test Test Monitoring Monitoring Monitoring Monitoring Monitoring

4 OPERATIONS SUMMARY

4.1 Mining Operations

Mining operations during the period were limited to the drilling, blasting and handling of waste rock/overburden material. No coal was mined during the reporting period. Table 4 presents the Production Summary at the end of the reporting period.

Table 4 - Production Summary

Material	Approved Limit	Previous Reporting Period (actual)	This Reporting Period (actual)	Next Reporting Period (forecast)
Waste Rock/Overburden	4.9 M m ^{3 1}	0	673,188 m ³	1,221,928 m ³
ROM Coal/Ore	1 Mtpa ²	0	0	715,500 t
Reject material	n/a	0	0	0
Saleable Product	n/a	0	0	419,800 t

¹ Environmental Assessment

4.2 Other Operations

4.2.1 Hours of Operations

Mining operations were undertaken during the reporting period within permitted operating times, i.e. 7:00am to 10:00pm Monday to Friday and 7:00am to 6:00pm on Saturdays, and not on public holidays.

4.2.2 Infrastructure Management

Management of infrastructure (e.g. buildings, roads, generators and pumps) and other facilities not specified elsewhere within this AR is undertaken on an as-needs basis or in accordance with statutory requirements in order to maintain them in an operationally efficient, safe, neat and tidy condition, and one which does not result in the direct or indirect generation of unacceptable environmental impacts.

² PA 06 0308 Consolidated

4.2.3 Exploration Drilling

Exploration drilling was undertaken on Mining Lease during the reporting period. All holes drilled have subsequently been sealed.

4.3 Next Reporting Period

The mine production rates are planned for approximately 0.72Mt of ROM coal and approximately 1.2 million bank cubic metres (Mbcm) of overburden during the next reporting period.

Vegetation clearing activities in mining areas over the next reporting period will be conducted in accordance with the approved MOP.

5 ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

There were no actions required from the previous Annual Review.

6 ENVIRONMENTAL PERFORMANCE

The following sub-sections document the implementation and effectiveness of the various control strategies adopted at the SCM, together with monitoring data for the reporting period. Existing monitoring sites are shown in Figure 2. Life of mine monitoring data is included as Appendices in this AR, where relevant, to allow for discussion on longer-term trends.

6.1 Air Quality

6.1.1 Criteria

The air quality criteria applicable to the SCM are specified in PA 06_0308 (consolidated) Schedule 3, Tables 7, 8 & 9, which are summarised below.

- Acceptable mean annual increase in deposited dust 2 g/m²/month.
- Mean annual dust deposition (all sources) 4 g/m²/month.
- Mean annual Total Suspended Particulate (TSP) matter (all sources) concentration 90 μg/m³.
- Mean annual PM₁₀ particulate level 30 μg/m³.
- 24 hour average PM₁₀ particulate level 50 μg/m³.

Monitoring of deposited dust is undertaken on a monthly basis whilst PM_{10} levels are monitored every 6 days.

6.1.2 Environmental Management Measures

In order to satisfy the criteria identified above, SCM has ensured that revegetation of disturbed areas has progressed as far as practicable and been maintained.

6.1.3 Dust Monitoring

Table 5 presents a summary of the deposited dust monitoring data. Figure 2 identifies the locations of the various deposited dust gauges maintained during the reporting period.

Table 5 - Deposited Dust Monitoring Data Summary

Site (See Figure 2)	EPL ID	Property Name	Annual Mean Total Insoluble Solids (g/m²/month)	Annual Mean Ash (g/m²/month)
SD1	1	Ferndale	0.9	0.5
SD3	2	Plainview	1.7	0.9
SD4		Lilydale	0.8	0.4
SD5	4	Ivanhoe	3.3	1.8
SD6	5	Illili	2.3	0.7
SD7	6	Innisvale	3.1	0.5
SD8		Woodlawn	0.9	0.4

A review of Table 5 shows that the annual average limit for deposited dust was not exceeded at any location during the reporting period. It should be noted that the annual average has been determined over 11 months, following a laboratory error. Although data was recorded continuously during the period, when the samples were sent to the laboratory for analysis the box of samples was dropped and destroyed.

SCM has one High Volume Air Sampler (HVAS - PM₁₀) located at the property Illili (EPL ID 7), to the north-west of the mine site (refer Figure 2).

The PM₁₀ results for the reporting period show compliance with the 24hr criteria, and the annual average criteria. Results have remained relatively stable, with the annual average dropping slightly to $12.42\mu g/m^3$ at the end of the reporting period. This is below the EA annual prediction of $22.1 \, \mu g/m^3$.

6.1.4 Key Environmental Performance/Management Issues

No key environmental performance/management issues were identified during the reporting period.

6.1.5 Proposed Improvements to Environmental Management

No improvements are proposed within the next reporting period.

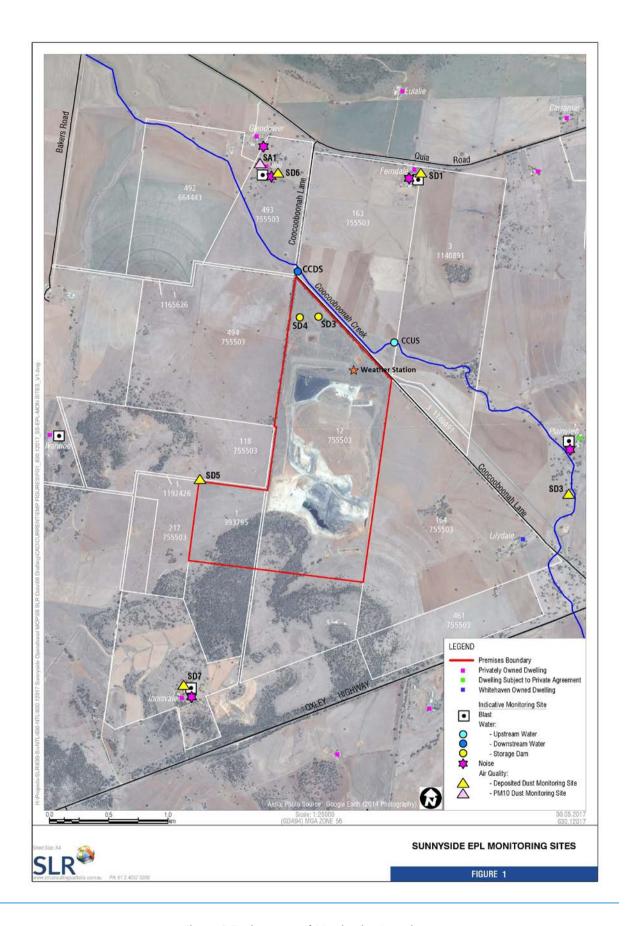


Figure 2 Environmental Monitoring Locations

6.2 **Biodiversity**

6.2.1 Threatened Flora

Investigations into the occurrence of threatened flora within the Project Approval Area were undertaken as part of the Environmental Assessment by Geoff Cunningham Natural Resource Consultants Pty Ltd in 2007, following field surveys in October and December 2006. The investigation identified no significant impact on threatened flora species, endangered ecological communities, endangered flora populations or critical habitat as a consequence of the development, either because they do not exist in the area or avoidance is possible due to project design.

Investigations identified a remnant of the White Box Yellow Box Blakely's Red Gum Woodland endangered ecological community within the study area but concluded that it would not be affected in any significant manner by the mine.

A remnant of the Native Vegetation on Cracking Clay Soils of the Liverpool Plains endangered ecological community was also identified within the study area. It was noted that a small section of this community would be temporarily affected by the Coocooboonah Lane re-alignment but the community would be rehabilitated and enhanced following rehabilitation after mining ceases. It was assessed that this action, due to its temporary impact and final environmental enhancement, would not require approval under the Commonwealth EPBC Act.

Much of the area has been cleared in the past and most of this cleared area has been cultivated. The vegetation on the cleared areas has been invaded by introduced species. The establishment of the mine site did not involve clearing of native vegetation and as such no biodiversity offsets were required.

6.2.2 Threatened Fauna

Investigations into the occurrence of threatened fauna within the Project Approval Area were undertaken by Kevin Mills and Associates as part of the Environmental Assessment, following surveys conducted in September 2006. These investigations identified that the proposed development was unlikely to significantly affect any of the threatened species, fauna populations or communities listed under the *Threatened Species Conservation Act* 1995, or their habitats.

It was also concluded that development of the mine was not likely to have a significant impact on any matter of national environmental significance listed under the *Environment Protection and Biodiversity Conservation Act 1999*. Referral to the Commonwealth Minister for the Environment for assessment and approval was therefore not warranted.

The area surrounding the mine site supports a viable koala population. NMPL has undertaken a number of measures to minimise the impacts on this population, including:

- Relocating the southern section of Coocooboonah Lane to avoid disturbing remnant koala habitat;
- Erecting a koala-proof fence around the active mine area;
- Minimising clearing and utilising local tree species for revegetation with an emphasis
 on koala feed trees. This has continued since the last reporting period with koala
 feed trees planted in koala corridor.

Fauna quadrat establishment was undertaken in November 2010 by Dr Leong Lim (Countrywide Ecological Services), where two grassland monitoring plots were established. Since establishment, roof tiles have been scattered throughout the quadrats to enhance the ground habitat structure and provide refuges for the ground fauna. The establishment of two woodland plots to the south of the active mining area occurred in February 2011, during a monitoring campaign. These plots are placed in open woodland, and open woodland with grassy understory communities.

Monitoring undertaken in September 2012 identified seven new bird species and the reoccurrence of a family group of Grey-crowned Babblers. The previously identified koala population was noted as not having been impacted by mining operations, and up to 10 species of micro bats were noted as being active in the vicinity of the mine, including the listed Yellow-bellied Sheathtail Bat.

Ecological monitoring for biodiversity was undertaken at SCM during December 2017, with a report on findings expected early in the next reporting period.

6.2.3 Weeds

Weed management within the project area predominately involves targeted monthly inspections to determine levels of weed infestation, and is control spraying is usually undertaken by Whitehaven's own qualified personnel, although additional broad scale

spraying and slashing was also undertaken across the SCM during autumn in preparation for recommencement. Spot spraying following monthly inspections was undertaken during the reporting period in July, October, and December 2017.

6.2.4 Feral Animal Control

Feral animal control for the SCM consisted of targeted trapping of pigs, with 8 captured and disposed of during the reporting period.

In view of the low frequency of occurrence, and in the absence of an extensive programme by all surrounding landowners, no other broad scale feral animal control programmes were considered warranted during the reporting period. In accordance with prior commitments, mine personnel will continue to monitor feral animal occurrences and implement further necessary control programmes if and when necessary.

6.2.5 Koala Management

During the reporting period 6 koalas were recorded onsite. The koala fence was inspected each month during the environmental inspections, and remains in functional condition. Additional plantings of 160 koala feed tree species were planted during the reporting period, along the koala corridor.

6.2.6 Key Environmental Performance/Management Issues

No key environmental performance/management issues were identified during the reporting period.

6.2.7 Proposed Improvements to Environmental Management

No improvements are proposed within the next reporting period.

6.3 Blasting

6.3.1 Criteria

Blasting criteria for the SCM are noted in PA 06_0308, and Condition L5 of EPL 12957, and included below:

The overpressure level from blasting operations must not:

- exceed 115dB (Lin Peak) for more than 5% of the total number of blasts over each reporting period; and
- exceed 120dB (Lin Peak) at any time, at any residence on privately-owned land.

Ground vibration peak particle velocity from the blasting operations must not:

- exceed 5mm/s for more than 5% of the total number of blasts during each reporting period; and
- exceed 10mm/s at any time, at any residence on privately-owned land.

6.3.2 Key Environmental Performance/Management Issues

No blasts undertaken during the reporting period exceeded the criteria. Results for the period are provided below in Table 6.

6.3.3 Proposed Improvements to Environmental Management

No improvements are proposed for the next reporting period.

Table 6 - Blast Monitoring Results

Location	Parameter	100%ile limit	Average	Max	95 th %ile limit	>95 th %ile
Ivanhoe	Air blast overpressure (dB(Lin Peak))	120	79.0	89.9	115	0
	Vibration (mm/s)	10	0.86	1.45	5	0
Plainview	Air blast overpressure (dB(Lin Peak))	120	77.8	112.8	115	0
	Vibration (mm/s)	10	0.61	1.0	2	0
Innisvale	Air blast overpressure (dB(Lin Peak))	120	105.4	109.8	115	0
	Vibration (mm/s)	10	0.52	0.98	5	0
Illili	Air blast overpressure (dB(Lin Peak))	120	103.6	109.1	115	0
	Vibration (mm/s)	10	0.84	0.84	5	0
Ferndale	Air blast overpressure (dB(Lin Peak))	120	98.2	105.2	115	0
	Vibration (mm/s)	10	0.71	1.38	5	0

6.4 Operational Noise

6.4.1 Criteria

Operational noise criteria for SCM are specified in PA 06 0308 and EPL 12957, as follows:

Location	Day	Evening	
	LAeq (15 min)	LAeq (15 min)	
All privately-owned land	35	35	

6.4.2 Environmental Management Measures

Control of noise generation and propagation at the mine is by a combination of general source and propagation path methods including:

- Where operationally feasible, scheduling activities to minimise operation of equipment in exposed locations when winds are blowing towards residences and elevated locations when temperature inversions are present;
- Equipment removal or replacement;
- Changing operational procedures;
- Restricting hours of operations;
- Enclosure of fixed items of plant, e.g. generators;
- Bunding close to noise sources to create obstructions to the propagation path;
- On-going site road maintenance using the mine-based grader; and
- Regular equipment maintenance.

6.4.3 Key Environmental Performance/Management Issues

No key environmental performance/management issues were identified during the reporting period. The first round of quarterly noise monitoring since recommencement occurred in November 2017, and returned compliant results. Testing will continue on a quarterly basis through the next reporting period.

6.4.4 Proposed Improvements to Environmental Management

No improvements are proposed within the next reporting period.

6.5 Aboriginal Heritage Management

6.5.1 Environmental Management Measures

An assessment of the cultural heritage of the mine site was conducted by Archaeological Surveys and Reports Pty Ltd (ASR). Prior to the investigation, ASR contacted the Red Chief Local Aboriginal Land Council (LALC) and Bigundi Biame Gunnedarr Traditional People to arrange for site officers to assist in the survey. A representative from each group was present for the site survey conducted on the 12th September 2006 and the coal transport route survey on the 7th December 2006. The ASR assessment was used in the preparation of the Environmental Assessment for the mine, undertaken by R.W. Corkery & Co. Pty Ltd on behalf of Namoi Mining Pty.

Four sites were recorded during the investigation, as detailed in Table 7. Only one site (AGG1) was recorded within the mine site while the three isolated artefact sites were identified to the south of the mine site.

All Aboriginal Heritage sites are managed in accordance with the Sunnyside Coal Mine Aboriginal Cultural Heritage Management Plan, prepared in accordance with Schedule 3 Condition 32 of PA 06_0308 Consolidated.

6.5.2 Consultation

No soil stripping of previously undisturbed areas took place during the reporting period. No additional Aboriginal cultural heritage items have been discovered during the reporting period and no consultation with Aboriginal stakeholders was conducted.

Site Description/Comments Site Name Site Type Axe grinding groove at the rim of a cliff-like scarp (beside a small water-filled natural depression in the Sunnyside Axe Grinding rock). Dimensions: 28cm (L) x 6cm (W) x 2cm (D). AGG1 Groove Located approximately 150m from the southern side of the open cut area. Isolated Flake with possible retouch to one margin located on Sunnyside ISO1 Artefact the bank beside the upper reaches of a dry creek (on a

Table 7 - Aboriginal Artefacts

		vehicle track). Dimensions: 21 x 12 x 3mm	
Sunnyside ISO2	Isolated Artefact	Proximal fragment of a flake located on the bank beside the upper reaches of a dry creek. Dimensions: 22 x 22 x 5mm.	
Sunnyside OS1	Artefact Scatter	Artefact scatter of at least ten artefacts in a lozenge-shaped area of 30 x 8m, on the upper slopes down slope of a contour bank down slope of a saddle. Artefact types: flakes and flaked pieces, including a backed blade.	
Source: Modified after ASR (2007) – EA SCSC Part 7			

6.5.3 Key Environmental Performance/Management Issues

No key environmental performance/management issues were identified during the reporting period.

6.5.4 Proposed Improvements to Environmental Management

No improvements are proposed within the next reporting period.

6.6 Natural Heritage

There are no features of natural heritage within the Project Approval area and hence, no specific management procedures are required.

6.7 Spontaneous Combustion

6.7.1 Environmental Management Measures

SCM is located within the Hoskissons Coal Seam which has been mined for over 120 years with a number of reported outbreaks of spontaneous combustion. Tests confirmed that coal from the SCM has the potential to spontaneously combust, and this was evident during the care and maintenance phase of the site. The Spontaneous Combustion Management Plan was reviewed in relation to the recommencement of operations, and monitoring of the affected areas has been ongoing.

6.7.2 Key Environmental Performance/Management Issues

There has been an improvement in spontaneous combustion onsite through the period, with conditions improved from the end of the previous reporting period.

6.7.3 Proposed Improvements to Environmental Management

No improvements are proposed within the next reporting period.

6.8 Bushfire Management

6.8.1 Environmental Management Measures

SCM is located within an area of cleared agricultural land. Whitehaven Coal personnel liaise with the local (Coocooboonah) Rural Fire Service, as required.

There was one grass fire adjacent to SCM on Coocooboonah lane during the reporting period, which was extinguished by the Rural Fire Brigade. No damage to SCM or neighbouring properties occurred.

6.8.2 Key Environmental Performance/Management Issues

No key environmental performance/management issues were identified during the reporting period.

6.8.3 Proposed Improvements to Environmental Management

No improvements are proposed within the next reporting period.

6.9 Environmental Performance Summary

An environmental performance summary for SCM is presented in Table 8.

Table 8 - Environmental Performance

Aspect	Approval Criteria / EIS Prediction	Performance during the reporting period	Trend / Key Management Implications	Implemented / proposed management actions
Air Quality	Refer Section 6.1.1	Approval criteria met.	Nil	Nil
Biodiversity	EIS prediction of no impact on known koala population.	No recorded impact on koala population. No koala deaths recorded onsite.	Nil	The Koala Management Plan will continue to be implemented in order to meet the requirements of the koala population.

Heritage	EIS prediction of potential blast impact on a recorded site.	No recorded impact on site.	Nil	Heritage site inspected quarterly to ensure precautionary measures still in place.
Spontaneous Combustion	EIS prediction of no material spontaneous combustion	Area of previous heating now within active pit once again.	Nil	Ongoing implementation of Spontaneous Combustion Management Plan.

7 WATER MANAGEMENT

The SCM lies within the catchment of the Namoi River. The majority of the surface water runoff flows northwards across the mine site. It then flows into Coocooboonah Creek which flows north-west within a constructed waterway paralleling Coocooboonah Lane. From there, it flows into Rock Well Creek then into Native Cat Creek which continues to flow north-west for 6km. Runoff then flows northwards within Collygra Creek where it flows across a floodplain area before flowing into the Namoi River some 25km north of the Mine Site. The remainder of the mine's surface water flows south into Coocooboonah Creek ultimately flowing into the Namoi River to the north.

The design of sediment detention basins within the disturbed area of the mine limits the opportunity for discharge of runoff from mine-disturbed area, i.e. after appropriate detention time to satisfy licensed discharge criteria.

Two wet weather discharge points are nominated in the current EPL 12957. These are Storage Dam 3 (EPL ID No. 9) and Storage Dam 4 (EPL ID No. 10) (refer Figure 2). Two additional monitoring points are nominated on the EPL for water quality monitoring during discharge events. These are Coocooboonah Creek Upstream (CCUS – EPL ID No. 11) and Coocooboonah Creek Downstream (CCDS – EPL ID No. 12) (refer Figure 2).

7.1.1 Surface Water Management

All sediment basins, storage dams and associated banks and drains have been designed and constructed in accordance with the *Managing Urban Stormwater: Soils and Construction Vol 2E Mines and Quarries* (DECC, 2008) in conjunction with the references to Volume 1 (Landcom, 2004).

As directed by the EPA (EPA letter dated 21st August 2015), where runoff from coal contact areas is captured in storage dams designed for sediment control, Sunnyside Coal Mine will need to establish whether the discharge from these structures contains pollutants that pose a risk of non-trivial harm to human health and/or the environment. Whitehaven is working with the EPA to determine appropriate licencing measures to address coal contact water requirements.

7.1.2 Surface Water Monitoring Results

SCM has a requirement to undertake surface water monitoring on a quarterly basis in addition to the monitoring of any wet weather discharge event. Due to below average

rainfall for much of the year, several dams were dry and unable to be sampled at each quarterly monitoring event.

Water quality monitoring locations are shown on Figure 2, and complete surface water quality monitoring results are provided in Appendix 1.

The quarterly monitoring results show that water quality within onsite storages was generally consistent with previous records, although both SB4 and SD4 remained dry for most of the period and therefore were unable to sample for the last 3 quarters of 2017. Results of electrical conductivity and total organic carbon remain generally consistent with previous years. Void water results were largely consistent with previous reporting periods with the exception of a slight increase in EC to 5790 μ S/cm, still remaining well below the previous maximum of 7270 μ S/cm, and below the range predicted within the Project's Environmental Assessment, being 5831 μ S/cm – 10999 μ S/cm.

The water in all sediment basins and storage dams is well within the discharge limits for oil and grease.

There were no wet weather discharges during the reporting period.

7.1.3 Key Environmental Performance/Management Issues

The construction of a new void water storage dam was completed during the reporting period to facilitate ongoing in-pit water management.

7.1.4 Proposed Improvements to Environmental Management

No improvements are proposed within the next reporting period.

7.1.5 Water Take

During the reporting period approximately 2.03ML of water was used on site. The water taken by the operation is summarised in Table 9.

Water Sharing Plan, Source and Passive take/ Active Water Entitlement TOTAL inflows Management Zone **Pumping** Licence (as applicable) Number Gunnedah - Oxley WAL 29537 120 units 0 2.8ML 2.8ML Basin Mdb **Groundwater Source**

Table 9 - Water Take

7.2 Groundwater Management

7.2.1 Environmental Performance/Management

The mine's performance with respect to groundwater performance/management, the prevention of pollution, and the assessment of impacts on groundwater availability to other surrounding users, has been assessed through groundwater level and chemistry monitoring undertaken at a series of piezometers and bores within the Project Area and adjacent properties.

7.2.2 Groundwater Monitoring

The details of groundwater monitoring throughout the reporting period are listed in Table 10. Monitoring sites are shown in Figure 2 and complete monitoring datasets are provided in Appendix 2.

Groundwater sampling and analysis was undertaken by ALS Acirl Pty Ltd during the reporting period. Below are some points to note regarding monitoring locations and frequencies:

- Bore 27356 has not been monitored since June 2012, as there is a windmill over the bore which no longer functions.
- Standing Water Level (SWL) data is unavailable for bores 27356, 44884, 3709, and
 Werona due to pumps in place over the bores.

Table 10 - Groundwater Monitoring Points

	Registered			Frequency	Purpose
Site ID (see Figure 2)	Bore No. & Licence No	Property/ Location	SWL*², EC*³ and pH	Representative Metals and lons	
P1* ¹	GW968386 90BL253767	"Plainview"	Quarterly	Six monthly	
P2*1	GW968387 90BL253768	"Ferndale"	Quarterly	Six monthly	To determine existing status and any impacts
Р3	GW968388 90BL253769	"Sunnyside"	Quarterly	Six monthly	
P7	GW968392 90BL254689	"Sunnyside"	Quarterly	Six monthly	To determine existing
P8	GW968393 90BL254690	"Sunnyside"	Quarterly	Six monthly	status and any impacts
3709*1	N/A	"Ivanhoe"	Quarterly	Six monthly*5	

22497*1	N/A	"Coocooboonah"	Quarterly	Six monthly	
44677*1	N/A	"Werona"	Quarterly*5	Six monthly	
44884*1	N/A	"Lilydale"	Quarterly	Six monthly	
6249*1	N/A	"Lilydale"	Quarterly	Six monthly	
901460	GW901460 90BL249138	"Illili"	Quarterly	Six monthly*5	
27356	GW027356 90BL020042	"Sunnyside"	Quarterly	Six monthly*5	To determine existing status and any impacts
45061	N/A	"Coocooboonah"	Quarterly	Six monthly*5	
Werona Production	90BL255246	"Werona"	Quarterly	Six monthly*5	
*1 Non-Company owned bore			trical Conductivity		
*5 – Not available this reporting period *4 Company production bore due to lack of access					

Groundwater levels

Groundwater levels have remained consistent at all locations monitored during the reporting period.

Groundwater quality

Analysis of samples taken during the reporting period has shown that groundwater quality has remained generally in line with historical data at all locations monitored. Water quality has been compared to the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000) (ANZECC) guidelines for stock watering (cattle). P3 continues to show Total Dissolved Solids (TDS) levels above the guidelines, (greater than 4000mg/L), although results for the period are the lowest in almost 9 years, finishing the period with a reading of 7100mg/L. Ivanhoe has shown a spike in iron, with a reading of 27.2mg/L. A similar spike occurred in April 2012 before returning to normal during the next quarter. The Ivanhoe bore will be tested again early in the next reporting period, and further investigation will be undertaken should levels not return to a normal range.

All other parameters remained stable during the reporting period.

7.2.3 Groundwater Management

Inflows into the open cut result from a combination of:

- Direct rainfall runoff and infiltration through the emplaced overburden which flows down-dip to the open cut sump(s); and
- Inflows from the exposed coal seam.

At the end of the reporting period an estimated 130 ML of water was held in the pit from rainfall and groundwater seepage. This water is contained within the void itself, and within a separate void water dam within the pit.

Contamination of groundwater is controlled by the management of chemical, oil and grease spills and storage, with:

- Vehicle maintenance carried out in designated areas;
- Any spills being cleaned up; and
- Fuels, oil and grease being stored within a bunded area.

Groundwater from surrounding bores, as well as the mine production bore, is monitored on a regular basis to detect and assess any changes in groundwater quality or level that may be attributable to the mine.

7.2.4 Key Environmental Performance/Management Issues

Pumping from the Werona Production bore was recommenced during the reporting period, and void water is being pumped from the pit to other void water storages onsite.

7.2.5 Proposed Improvements to Environmental Management

SCM will continue to undertake regular water monitoring to assess water chemistry and quality, along with management to ensure ongoing water supply for operational demand.

8 REHABILITATION

8.1 Rehabilitation Performance during the Reporting Period

8.1.1 Status of Mining and Rehabilitation

The status of mining and rehabilitation at the completion of the reporting period is presented in Table 11 and Figure 3.

Table 11 - Rehabilitation Status

Mine Area Type ¹	Previous	This Reporting	Next Reporting
	Reporting	Period (Actual)	Period (Forecast)
	Period		
	2015/16 (ha)	2016/17 (ha)	2018 (ha)
A. Total Mine Footprint	231.3	231.4	231.4
B. Total Active	73.6	74.6	74.6
Disturbance			
C. Land Being Prepared	0	0	0
for Rehabilitation			
D. Land Under Active	31.2	31.2	31.2
Rehabilitation			
E. Completed	0	0	0
Rehabilitation			

¹Refer Annual Review Guideline (p.11) for description of mine area types.

8.1.2 Post Rehabilitation Land Uses

Two final rehabilitation land uses are to be established at Sunnyside, being Pasture and Woodland. The eastern, northern and western slopes of the out of pit emplacement area will be planted with locally occurring tree and shrub species, with the objective of reestablishing woodland areas and providing habitat and food trees for the local koala population. The plateau on top of the waste emplacement and the flatter areas around the base of the emplacement area will be returned to pasture.

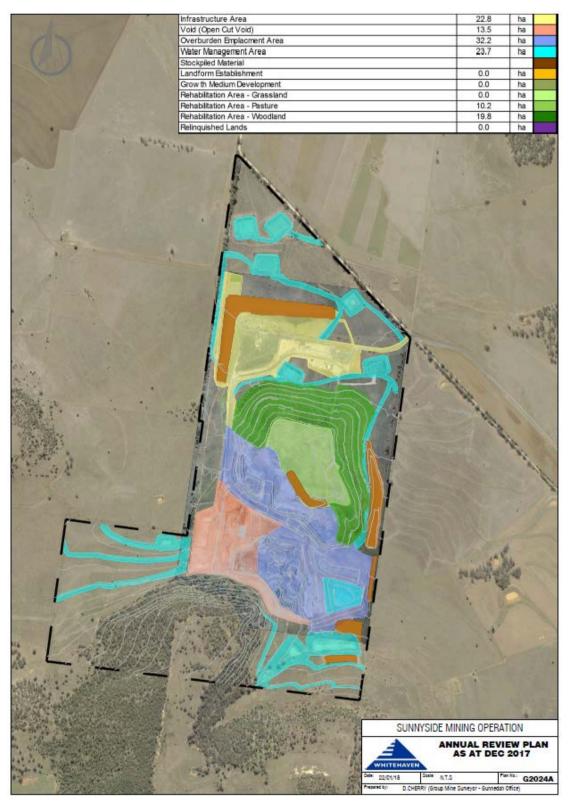


Figure 3 - Status of Mining and Rehabilitation

8.1.3 Rehabilitation Undertaken

There was no additional rehabilitation undertaken on site during the reporting period, although some additional tree planting was undertaken within the koala corridor.

8.1.4 Rehabilitation Monitoring

Winter and spring monitoring programmes were historically undertaken on site in accordance with the then Rehabilitation Management Plan. Part of this monitoring provided an annual snapshot of the habitats available in these areas and habitat utilisation by fauna. This was then compared to baseline data collected from adjacent unaffected land surrounding the mine to determine its success and progression in regards to habitat value for native and threatened species. No rehabilitation monitoring was undertaken during the reporting period.

Rehabilitation condition is monitored through monthly environmental inspections. The monitoring of rehabilitation condition involves the regular inspections of ground cover, trees and the presence of erosion and weeds.

Ecological rehabilitation monitoring was undertaken at SCM during December 2017, with a report on findings expected early in the next reporting period.

8.1.5 Weeds Management

Monthly inspections of rehabilitation areas, as well as periodic general observations of the site, are undertaken in order to identify the presence of noxious weeds. No noxious weed infestations were identified within rehabilitated areas during the reporting period. As detailed in Section 6.2.3 there were occurrences of non-noxious weeds across the site, however broad scale spraying and slashing was undertaken across the SCM during Autumn in preparation for recommencement, and additional spot spraying following monthly inspections was undertaken during the reporting period in July, October, and December 2017.

8.1.6 Renovation or Removal of Buildings

One unused work shop area was decommissioned during the period, involving the removal of 3 storage containers from site.

8.1.7 Other Rehabilitation Undertaken

Recommencement activities resulted in minor repairs and clean ups of the administration buildings and work shop areas, along with similar maintenance undertaken on bunds, wind rows and roads onsite to a safe an operational standard.

8.1.8 Departmental Sign-off of Rehabilitated Areas

Departmental sign-off has not been requested for any rehabilitated areas.

8.1.9 Variations in Activities against MOP/RMP

An operational MOP was developed and approved during the reporting period to address recommencement. A Closure MOP will be developed for SCM during the next reporting period.

8.1.10 Trials, Research Projects and Initiatives

No rehabilitation trials, research projects or other initiatives were undertaken during the reporting period.

8.1.11 Key Issues to Achieving Successful Rehabilitation

Two key issues to achieving successful rehabilitation are:-

- Landform stability (Final Void), and
- Spontaneous combustion.

Ongoing management of spontaneous combustion will continue to be undertaken on site, as per the Spontaneous Combustion Management Plan. Management measures to address the issues of landform instability will be described in the site Closure MOP to be developed in consultation with DRE.

8.2 Actions for Next Reporting Period

- The submission and approval of the Closure MOP will provide the strategies to achieve agreed final rehabilitation outcomes.
- Rehabilitation condition is monitored through monthly environmental inspections.
 The monitoring of rehabilitation condition involves the regular inspections of ground cover, trees and the presence of erosion and weeds.

 In accordance with the Koala Management Plan, the expanding of koala habitat and the protection of existing habitat will be undertaken during the next reporting period through additional plantings and the fencing of designated areas

9 **COMMUNITY**

SCM maintains a designated complaints line and, in the event of a complaint, details pertaining to the complainant, complaint and action taken are recorded.

There were no complaints received for the SCM during the reporting period. The five year period of records indicate a low steady trend of complaints, with 1 complaint in 2015/16, 0 complaints in 2014/15, 1 in 2013/14, 7 in 2012/13, and 2 in 2011/12.

Any complaints that are made are reported to the Community Consultative Committee and documented in the AR. A complaints register is also maintained on Whitehaven's website.

Community contributions are managed in accordance the Whitehaven Coal Donations and Sponsorship Policy.

10 INDEPENDENT AUDIT

An Independent Environmental Audit (IEA) was undertaken by ERM during the previous reporting period.

Non-compliances with project approvals identified by the IEA were risk ranked by the auditor in accordance with the compliance status key for Table 2, and SCM subsequently developed an Audit Action Plan for these non-compliances. The Audit Action Plan is available on the Whitehaven Coal website and the individual non-compliances have not been replicated in Table 3.

Outstanding items from the 2016 Audit Action Plan, and how they are being addressed, are summarised in Table 12 below.

Table 12- 2016 IEA Outstanding Action Table

Condition/Plan	IEA Proposed Action	IEA Action Plan Timing
	Statement of Commitments	19
9.12	Future work towards mine closure and relinquishment will require significant renewed rehabilitation efforts to improve the currently poor native non-tree species presence (e.g. ground and shrub layers).	As per Mining Operations Plan
9.20	Activities described in the Rehabilitation and Landscape Management Plan were not undertaken in previous periods because of low feral species prevalence. Pig trapping is ongoing.	Ongoing
11.1	Identify areas suitable for fencing to encourage natural regeneration in those boundary corridors as stated.	Areas of native vegetation are fenced to the south of the site, along with a fenced boundary corridor on the western boundary of the SCM. Additional tree planting and subsequent fencing will be undertaken within the next reporting period.
14.3	No evidence of SMU segregation aside from topsoil emplacement.	Review currently stockpiled material. Work has commenced on this action, with a report due early within the next reporting period.
14.4	Recommended that soil pH is recorded during soil management and emplacement.	As required
14.5	If mining is recommenced in future, recommendation for sediment fencing around bare stockpiles.	Inspections following recommencement have identified limited areas in need of sediment fencing. These areas are due to be completed during the next reporting period.
14.6	Topsoil stockpiles exceed committed height.	Review currently stockpiled material. Work has commenced on this action, with a report due early within the next reporting period.
14.8	Soil stockpile segregation should be improved.	Soil resource audit to be undertaken prior to commencement of final rehabilitation activities.

AR 2016/2017

17.5	Future tree planting should be done with a more	Incorporate into final
	random planting.	revegetation works.

11 INCIDENTS AND NON-COMPLIANCES DURING THE REPORTING PERIOD

11.1 Reportable Incidents

No environmental incidents occurred at SCM during the reporting period.

11.2 Non-compliances

All of the non-compliances with PA 06_0308 have been ranked as either administrative or low, with very limited potential for significant environmental harm, and are addressed below.

- Condition M2.1 of EPL 12957 requires the sampling and analysis of deposited dust.
 Samples were collected for each month of the reporting period, as per the licence, however as noted in section 6.1.3 the samples were unfortunately destroyed at the laboratory prior to analysis.
- Schedule 3 Condition 20 of PA 06_0308 and condition M4.1 of EPL 12957 refer to
 the requirement of continuous real time meteorological monitoring. Periodic
 connection failure and equipment malfunction resulted in minor data gaps during
 the reporting period. Regular maintenance is performed on the meteorological
 station.

11.3 Regulatory Actions

No regulatory actions (official cautions or warning letters, penalty notices or prosecution proceedings) were undertaken with respect to the Sunnyside Coal Mine during the reporting period.

ACTIONS TO BE COMPLETED IN THE NEXT REPORTING PERIOD

The following measures will be continued, or implemented, in the next reporting period to improve the environmental or community performance of the operation:-

- Undertake activities in accordance with the MOP;
- The continuation of environmental monitoring and management;

- Completion of outstanding IEA actions;
- Review and revision of various Environmental Management Plans; and
- Continued community liaison and engagement with local stakeholders.

Appendix 1

SURFACE WATER MONITORING DATA

Sunnyside Surface Water Monitoring Data

Part	Sunnyside Surfa	ace Water	Monitoring Data						_						_									
Section Sect	Sample No.		Date	Time	pH Field	pH Lab	Conductivity	Conductivity	Suspended	Organic Carbon		Alkalinity as	Alkalinity as	Alkalinity as	Aluminium	Antimony	Chloride	Molybdenum	Selenium	Sodium	Arsenic	Manganese	Iron	Comments
Section Sect	ES1117295-002	SB1	10-Aug-11	10:45	9.3	9.07	648	536	46	47	<5					<0.001		0.007	<0.01		0.002			
Secondary Seco		_																						
Section Sect																								
Section Sect		_						364	136	21	<5					<0.001		0.005	<0.01		0.006			
Page							310				<5					<0.001		0.002	<0.01		0.006			
Profession 19	ES1318099-002	SB1	13-Aug-13	8:30	8.87	8.47	405	513	343	22	<5					<0.001		0.003	0.01		0.005			1
February	ES1325115-001	SB1	18-Nov-13	10:20	9.7	8.88	399	390	46	13	<5					<0.001		0.007	<0.01		0.005			
	ES1410234-002		07-May-14	10:15	8.8	8.35	452		196	4	<5					<0.001		0.003	<0.01		0.005			<u></u>
Personal Column		_	05-Aug-14		8.6					20	<5					<0.001			<0.01					
Second Column		_																						
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STORING 167	ES1536059-004	SB1	11-Nov-15	9:10	9.5	8.64	366	391	194	8	<5					<0.001		0.003	<0.01		0.007			
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Company Comp												1		1	1								-	 I
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Figure 1966																							-	
Exercised Set Corport 118																								·
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Section Sect	ES1410234-003	SB2	07-May-14	11:30	8	8.45	492	474	59	3	<5										0.001			1
Section Sect	ES1417254-002	SB2	05-Aug-14	12:00	9.3	8.53	522	494	11	5	<5										0.001			1
Company Comp	ES142449-001	SB2	06-Nov-14	9:00	9.1	8.41	738	702	21	6	<5													i
FESTINGSON SECONOMY SECONOM	ES1503593-001	SB2	12-Feb-15	925	9.2	8.49	497	446	20	4	<5					< 0.001		0.003	<0.01		0.002			i
SECTION COLD 1960 1970	ES1521694-004	SB2	11-May-15	12:45	8.7	8.27	283	278	40	3	<5					<0.001		0.002	<0.01		0.002			i .
SECONDAL	ES1528398-003	SB2	13-Aug-15	10:35	8.9	8.38	332	315	5	<1	<5					<0.001		0.001	<0.01		0.001			
Section Sect	ES1536059-003	SB2	11-Nov-15	10:20	9.2	8.85	384		13	5	<5					<0.001		0.003	<0.01		<0.001			i
SECONDO SECO		_	04-Feb-16	9:25	9.1	8.6	308			4	<5													
September Sept		_	,							8	<5													
General Column Sect 190										.						<0.001		<0.001	<0.01		<0.001			
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ESTINATION SIGN O-Nov-17 0.35 0.3 7.9 1960 1760 121 11 6.5			•							.		-												
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ESTIONS-100 SSS OS-May-11 OSS OS	ES1/28336-001	SBZ	09-NOV-17	9:35	8.3	7.9	1690	1760	121	11	<0					<0.001		0.008	<0.01		0.002			
ESTIONS-100 SSS OS-May-11 OSS OS	ES110/065-001	SB3	08-Mar-11	0.30	1	8.40		1300	20	_1	-5	-				1								
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EST13574-001 S83 15-03-11 16:00 7-84 7.64					8.8		2250									<0.001		0.012	<0.01		<0.001			Tarbia/ Cacar
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ES1272700-002			01-May-12				498			2	<5					<0.001		0.015	<0.01		0.002			<u> </u>
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ES1318099-005 SB4 13-Aug-13 9:00 7.99 8.07 347 340 110 9 <5		_																						Jam lovel low
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ES1624857-003 SB4 01-Nov-16 11:50 8.5 7.62 235 255 98 15 <5 98 15 55 55 98		_	,									1		1	1	< 0.001		0.001	<0.01				-	 I
ES1004139 SB5 04-Mar-10 12:50 7.85 412 30 6 <5 5 6 <5 6 <5 6 <5 6 <5 6 <5 6 <5 6 <5 6 <5 6 <5 6 <5 6 <5 6 <5 6 <5 6 <5 6 <5 6 <5 6 <5 6 <5 6 <5 6 <5 6 <5 6 <5 7 8 8 8 24 25 2 2 0.001 0.01 0.002 0.002 0.001 0.002 0.001 0.002 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001												1		1	1	10.001		5.551	10.01		2.001		-	 I
ES1109425-003 SB5 05-May-11 11:40 8.93 759 36 4 <5 Turbid/Odour ES1117295-006 SB5 10-Aug-11 8.45 9.3 8.9 940 768 88 24 <5 <0.001 0.01 <0.01 0.002 ES1125734-006 SB5 22-Nov-11 9:30 9.5 8.65 636 504 352 43 <5 <0.001 0.002 <0.01 0.012 ES1203324-006 SB5 14-Feb-12 12:00 8.8 8.46 464 382 14 3 <5 <0.001 0.016 <0.01 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001	1 12 1231 000	1 331			0.0		1		1			1		1		1							-	
ES1109425-003 SB5 05-May-11 11:40 8.93 759 36 4 <5 Turbid/Odour ES1117295-006 SB5 10-Aug-11 8.45 9.3 8.9 940 768 88 24 <5 <0.001 0.01 <0.01 0.002 ES1125734-006 SB5 22-Nov-11 9:30 9.5 8.65 636 504 352 43 <5 <0.001 0.002 <0.01 0.012 ES1203324-006 SB5 14-Feb-12 12:00 8.8 8.46 464 382 14 3 <5 <0.001 0.016 <0.01 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001	ES1004139	SB5	04-Mar-10	12:50		7.85		412	30	6	<5	1		1		1							-	
ES1117295-006 SB5 10-Aug-11 8:45 9.3 8.9 940 768 88 24 <5 <0.001 0.01 <0.01 0.002 ES1125734-006 SB5 22-Nov-11 9:30 9.5 8.65 636 504 352 43 <5 <0.001 0.002 <0.01 0.012 ES1203324-006 SB5 14-Feb-12 12:00 8.8 8.46 464 382 14 3 <5 <0.001 0.016 <0.01 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001																İ							-	Turbid/Odour
ES1125734-006 SB5 22-Nov-11 9:30 9.5 8.65 636 504 352 43 <5 <0.001 0.002 <0.01 0.012 ES1203324-006 SB5 14-Feb-12 12:00 8.8 8.46 464 382 14 3 <5		_	,		9.3		940									<0.001		0.01	<0.01		0.002		-	
ES1203324-006 SB5 14-Feb-12 12:00 8.8 8.46 464 382 14 3 <5		_	•																					
	ES1203324-006	SB5	14-Feb-12	12:00	8.8	8.46	464	382	14		<5					<0.001		0.016	<0.01		<0.001			<u> </u>
ES1219038-005 SB5 02-Aug-12 11:00 8.48 7.98 351 401 10 2 <5 <	ES1210728-007	SB5	01-May-12	9:20	8.3	8.74	543	452	34	3	<5					<0.001		0.016	<0.01		0.001			
	ES1219038-005	SB5	02-Aug-12	11:00	8.48	7.98	351	401	10	2	<5					<0.001		0.009	<0.01		<0.001			

	Sample					Electrical	Electrical	Total	Total Organic	Grease &	Total	Hydroxide	Carbonate	Bicarbonate										
Sample No.	Location	Date	Time	pH Field	pH Lab	Conductivity @25C (μS/cm)	Conductivity (µS/cm)	Suspended Solids (mg/L)	Carbon (TOC)	Oil (mg/L)	Alkalinity	Alkalinity as CaCO3	Alkalinity as CaCO3	Alkalinity as CaCO3	Aluminium	Antimony	Chloride	Molybdenum	Selenium	Sodium	Arsenic	Manganese	Iron	Comments
ES1303279006	SB5	12-Feb-13	10:20	8.02	7.53	152	144	266	2	<5						<0.001		<0.001	<0.01		0.008			
ES1318099-006	SB5	13-Aug-13	10:30	7.55	7.63	160	158	471	10	<5						<0.001		0.012	0.02		<0.001			Dam level low
ES1410234-005	SB5	07-May-14	12:05	8.5	7.48	225	221	6750	56	<5											0.019			
ES1417254-003	SB5	05-Aug-14	12:10	8.1	7.81	177	162	5500	54	8						-0.004		-0.004	0.00		<0.001			
ES1521694-007 ES1528398-004	SB5 SB5	11-May-15 13-Aug-15	12:00 10:15	8.2 8.4	7.66 7.61	104 130	102 138	202 2330	4	25 6						<0.001 <0.001		<0.001 <0.001	0.02 0.04	1	0.012		-	
ES1536059-002	SB5	13-Aug-15 11-Nov-15	9:55	8.8	7.54	184	169	568	9	<5						<0.001		<0.001	0.04		0.021			
ES1602640-003	SB5	04-Feb-16	9:10	8	7.44	106	105	696	4	<5						40.001		40.001	0.01		0.01			
ES1609755-003	SB5	05-May-16	9:00	8.3	7.69	101	135	344	6	<5						<0.001	0.004	<0.001	<0.01					
ES1617490-004	SB5	08-Aug-16	10:45	7.8	7.66	150	142	91	4	<5 .r.						<0.001	<0.001	<0.001	<0.01					
ES1624857-004 ES1702106-003	SB5 SB5	01-Nov-16 30-Jan-17	11:35 10:10	8.2	7.67 7.46	117 81	143 156	26 492	2	<5 <5														
ES1711022-002	SB5	08-May-17	12:05	7.6	7.75	254	262	5950	8	<5						<0.001		<0.001	0.01		0.02			
ES1719717-002	SB5	08-Aug-17	12:00	8.9	7.79	163	159	138	4	<5						<0.001		<0.001	<0.01		0.006			
EC4240000 000	CD4	42 4 42	0.20	0.07	0.47	405	540	242	20							-0.004		0.005	0.04		0.000			Dam level leve
ES1318099-002 ES1325115-001	SD1 SD1	13-Aug-13 18-Nov-13	8:30 10:20	8.87 9.7	8.47 8.88	405 399	513 390	343 46	22 13	<5 <5						<0.001 <0.001		0.005 0.005	0.01 <0.01		0.003		\vdash	Dam level low Low water level
ES1410234-002	SD1	07-May-14	10:20	8.8	8.35	453	452	196	4	<5						Q0.001		0.003	Q0.01		0.007			LOW Water level
ES1417254-001	SD1	05-Aug-14	11:10	8.6	8.53	609	644	40	20	<5											0.003			
ES1521694-002	SD1	11-May-15	14:05	9	8.32	323	314	107	6	<5						<0.001		0.002	<0.01		0.002			
ES1528398-002	SD1	13-Aug-15	9:25	9.2	8.58	508	497	24	7	5						<0.001		0.004	<0.01		0.003			
ES1536059-004	SD1	11-Nov-15	9:10	9.5	8.64	366	391	194	8	<5			ļ		ļ	<0.001		0.003	<0.01	1	0.007		\vdash	
ES1602640-001	SD1	04-Feb-16	10:25	9.2	8.03	228	240	193	55	6					 	0.001		0.000	0.01	-	0.000		\vdash	
ES1609755-001 ES1617490-002	SD1 SD1	05-May-16 08-Aug-16	10:00 11:15	9.4 8.3	8.45 7.97	217 265	332 258	24 65	6	<5 <5					-	<0.001 <0.001		0.002 0.001	<0.01 <0.01	-	0.006 0.004		\vdash	
L31017490-002	ועט	00-Aug-10	11.15	0.3	1.31	200	200	00	"	ξ.					 	\U.UU1		0.001	<0.01	-	0.004		 	
ES1023171-002	SD3	15-Nov-10	9:40		7.54		166	140	3	<5														
ES1004139	SD4	04-Mar-10	13:15		8.08		321	12	<1	<5														
ES1009878	SD4	24-May-10	9:25		8.11		351	9	2	6														
ES1016142-001	SD4	11-Aug-10	13:00		7.82		312 186	26	<1	<5 .r						1			-				\vdash	
ES1023171-001 ES1104965-002	SD4 SD4	15-Nov-10 08-Mar-11	9:20 9:50	1	7.81 8.72		271	56 15	2	<5 <5						+			-				\vdash	
ES1109617-001	SD4	09-May-11	11:51		8.43		394	62	5	<5														
ES1117295-001	SD4	10-Aug-11	11:15	8.9	8.17	360	313	13	10	<5						<0.001		0.003	<0.01		<0.001			-
ES1016142-001	SD4	11-Aug-11	13:00		7.82	312		26	<1	<5														
ES1125734-001	SD4	22-Nov-11	10:45	9.5	8.74	372	299	19	8	<5						<0.001		0.005	<0.01		0.002			
ES1203324-001	SD4	14-Feb-12	10:40	8.9	8.2	274	227	16	5	<5						<0.001		0.006	<0.01		<0.001		-	
ES1210728-002 ES1219038-001	SD4 SD4	01-May-12 02-Aug-12	11:00 11:30	8.1 8.94	7.9 8.63	330 269	276 311	26 8	5	<5 <5						<0.001 <0.001		0.005 0.005	<0.01 <0.01		0.001 <0.001			
ES1227200-001	SD4	15-Nov-12	9:10	8.22	8.24	582	546	66	6	<5						<0.001		0.003	<0.01		0.003			
ES1303279001	SD4	12-Feb-13	12:00	9.14	8.49	458	429	248	9	<5						<0.001		0.005	<0.01		0.004			
ES1318099-001	SD4	13-Aug-13	9:30	8.33	8.07	799	762	318	26	<5						<0.001		0.004	<0.01		0.005			
ES1410234-001	SD4	07-May-14	10:35	8.1	7.69	717	677	3190	13	<5											0.013			
ES1521694-001	SD4	11-May-15	13:05	8.2	7.86	299	286	176	7	<5						<0.001		<0.001	0.01		0.01			
ES1528398-001 ES1617490-001	SD4 SD4	13-Aug-15 08-Aug-16	10:55 9:50	8.4 7.8	8.01 7.33	403 230	389 235	255 232	8 12	5 <5						<0.001 <0.001		<0.001 <0.001	0.01		0.01 0.012		\vdash	
ES1624857-001	SD4	01-Nov-16	10:10	7.8	7.63	300	314	85	13	<5						<0.001		<0.001	0.02		0.012			
ES1702106-001	SD4	30-Jan-17	10:30	8.1	7.81	186	180	179	11	<5														
ES1104965-003	VOID	08-Mar-11	9:15		7.68		4220	23	<1	<5														
ES1109617-003	VOID	09-May-11	12:40	1 .	8.3		4550	6	58	<5												6.5		
ES1117295-007	VOID	10-Aug-11	12:15	8.4	8.3	5240	4050	10	5	<5 -5	444	<1	<1	444	0.1	-	1140			720	0.005	0.054	0.11	
ES1203324-007 ES1219038-006	VOID VOID	14-Feb-12 02-Aug-12	12:45 10:00	8.6 8.64	8.59 8.4	2280 3490	1810 4400	10 9	<1 <1	<5 <5	398	<1	46	352	0.03		278		 	420	0.005	0.004	0.06	
ES1227200-004	VOID	15-Nov-12	10:30	8.46	8.44	5360	4720	30	<1	<5					1									-
ES1303279007	VOID	12-Feb-13	12:40	8.68	8.58	5090	4480	5	2	<5					<u></u> _									
ES1310164-003	VOID	02-May-13	9:00	8.78	8.54	4870	5350	6	1	<5													\Box	
ES1318099-007	VOID	13-Aug-13	8:00	8.48	8.51	5080	4810	22	2	<5	100		40	222		0.001	440-	0.002	0.04		0.088	0.01:	0.0-	
ES1325115-003 ES1402292-002	VOID	18-Nov-13 05-Feb-14	10:45 11:10	8.8 8.9	8.5 8.5	5850 7270	5370 6210	6 <5	3 52	<5 <5	403	<1	43	360	0.02	-	1120	0.004		-		0.011	<0.05	
ES1410234-006	VOID	05-Feb-14 07-May-14	9:30	8.9	8.51	6620	6210	26	<1	<5 <5	629	<1	28	401	0.02	-	1210			933	0.002	0.007	<0.05	
ES1417254-004	VOID	05-Aug-14	10:55	8.7	8.57	6410	5930	<5	4	<5		··		.3.	1.02					1 200	3.302	2.30.	1 1	-
ES142449-002	VOID	06-Nov-14	9:20	8.8	8.66	6610	6330	6	3	<5											0.001			
ES1503593-002	VOID	12-Feb-15	825	9.1	8.66	5940	6100	7	3	<5													\Box	
ES1521694-008	VOID	11-May-15	13:50	8.8	8.44	5590	5270	10	2	<5	304	<1	24	280	0.31		1150			764	0.002		\vdash	
ES1528398-005	VOID	13-Aug-15	9:05 8:50	8.8	8.46	5580 5850	5190 5270	9	<1	<5 <5					 								 	
ES1536059-001 ES1602640-004	VOID	11-Nov-15 04-Feb-16	8:50 10:05	8.7 9.1	8.53 8.68	5850 5580	5270 5040	6	1	<5 <5					 				 	<u> </u>			 	
ES1609755-004	VOID	05-May-16	9:40	8.6	8.51	6790	5890	<5	2	<5					0.07			<0.001			<0.001			
ES1617490-005	VOID	08-Aug-16	11:45	8.4	8.39	5920	5580	<5	2	<5														
ES1624857-005	VOID	01-Nov-16	10:45	8.6	8.52	5390	4910	<5	3	<5														
ES1702106-004	VOID	30-Jan-17	11:30	8.7	8.63	5380	5070	16	3	<5										ļ			\vdash	
ES1711022-001 ES1719717-003	VOID	08-May-17 08-Aug-17	10:45 11:35	8.9 9.1	8.5 8.38	5460 5620	5580 5350	6 29	3	<5 <5					0.02						<0.001	0.02	 	
ES1719717-003 ES1728336-002	VOID	08-Aug-17 09-Nov-17	9:10	9.1 8.4	8.38	5620	5350	29 8	2	<5 <5													 	
201720000-002	V 01D	00 1404.11	5.10	0.4	3.00	3730	3020	†							1									
<u> </u>			-	-		<u> </u>	<u> </u>				i							L		-				

Appendix 2

GROUNDWATER MONITORING DATA

	et et 0000 6500 812 64 550 730
	ct c1 552 352 52 0.88 c0.05 c0
	-c1 -c1 -005 -005 -400 -205 -110 -020 -020 -050 -200c1 -c1 -c1 -000 -004 -006 -007 -007 -007 -007 -007 -007 -007
	ct ct 896 896 40.0 442 0.06 c0.06 0.61 0.61 2000
The column	-t -t 995 995 415 521 72 -0.05 0.28 2520
	-ct -ct -900 -920 -922 -0.83 -932 -0.00 -1.81 -1.84 -3469
	c1 c1 c70 397 57 362 500 3800 3800 c1 c1 c1 652 852 495 02 405 381 381 381 381 381 381 483 383 600
	-1 100 AD 270 470 171 0.00 441 444
	c1 c1 64 844 879 0.4 40.01 40.02 598 598 300 c1 c1 c70 300 41.5 310 40.01 6.00 600 500 200 c1 c1 c70 770 451 5 600 600 200 200 200 c1 c1 c1 c2 300 631 100 0.00 6.59 6.59 6.59 220
	ct ct 796 796 86 3.72 6.66 6.66 6.65 6.65 500 ct ct 360 430 377 426 426 426 520
	-rt -rt 706 706 706 706 707 407 407 407 407 407 407 407 1007 10
Column C	
	ct ct 070 000 100 100 200 200 100 400 100 100 100 100 100 100 100 1
Section Sect	ct ct 768 798 198 148 cut 160 160 cl cl 797 791 160 614 c057 617 617 617 617 617 617 617 627 627 628 630 6301 6307 637
*** **********************************	c1 c1 656 668 105 4.51 -6.00 0.54 1.53 1.27 720 c1 c1 c1 7.75 7.78 157 4.47 -6.10 <t>-0.59 0.59</t>
*** Section 1.5 *** Section 1.	<1 <1 785 785 154 2.18 0.06 <0.04 0.04 0.04 0.05
	c1 c1 c8 697 000 429 0.1 c00 0.03
## 15 15 15 15 15 15 15 15	
348 31 52 52 53 53 53 53 53 53 53 53 53 53 53 53 53	4 4 70 70 70 74 40 00
Change CV CV CV CV CV CV CV C	-1 -1 666 656 809 283 -026 59 59 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1
Marcol M	
March 100 10	<1 <1 659 659 51 494 006 2560
*** **********************************	ct ct 096 686 487 316 006 c006 464 464 2900 ct ct 770 770 507 586 c0 M c0 M 47 47 2900
1	et et 600 800 870 870 870 870 870 870 870 870 8
1	
Company Comp	
- Madel 10 17 17 17 18 18 19 19 19 19 19 19 19 19 19 19 19 19 19	-1 27 144 276 174 148 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
10.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
## 1 1 2 2 3 3 4 4 5 4 5 5 4 5 5 5	-1 -1 295 295 108 108 37 5.12 -0.06 0.06 0.04 592 -1 -1 193 193 116 0.06 4.86 -0.06 0.07 0.07 613
- Actual - Co. C	ct ct 246 246 37.4 12.5 c0.01 0.05 0.05
1	<1 <1 <1 222 220 225 1.66 0.31 1.96 1.47 <1 <1 <1 251 251 30.4 0.63 86.4 0.07 0.07 0.14 1530
54ec 1 510 152 153 753 250 153 753 250 153 753 250 150 153 753 250 150 153 753 250 150 153 753 250 150 153 753 250 150 153 753 250 150 153 753 250 150 153 753 753 250 150 153 753 753 753 753 753 753 753 753 753 7	-t -t 796 296 14 243 387 619 666 6155 -t -t 200 200 327 4.08 322 1100
27-Ph-96 925 95.00 1520 7-7 1200 222 0.00 c/001 c/05 0.01 c/05 0.02 c/05 0.01 c/05 0.02 c/05 c/05 c/05 c/05 c/05 c/05 c/05 c/05	
Here 5 1 5 1 5 1 7 1 8 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1 7	
No. 10 10 10 10 10 10 10 10	

	9.Mec.11 1350 14-Jun-11 1020 21-Sep-11 1150	Bore covered Bore covered Bore covered	715 74 755	4141 3900	15.3 18.4 0.05 <0.001		0.368	<0.001	40 0001	<0.001 0.002	0.021	109	0.002	0.036	0.000	<901	0.104	<0.0001	7.64 5600 7.84 5650	170 300	474	24 19	56.5 1350 139	-4	-11	694	636	548 17 003	-0.00	193	196	╕
	4Chartt 15th	Bore covered	745 83 812		95.9 0.98 0.003 19.5		0.536	×0.001	e0.0001	40.004 0.004	0.029	2.2	0.003	0114	0.004	40.01	0.104	×0.0001	7.80 5950	F9 405	5407	×	#1.2 #540 #52	- 4	-	556	556	577 449 029	40.0M	0.07	0.07	3835
	20-Jun-12 1210 12-Sep-12 1250 7-Sep-17 1150 18-Mar-12 1130	Sore covered Sore covered Sore covered	-																												=	ᆿ
	9-345-13 1140 6-5m-11	Bore covered Bore covered	_																												=	3
	12-Nov-14 1210 12-Nov-15	Bore covered Bore covered					H		=																	=	=				=	=
	11-Mov-16	Bore covered Bore covered																								=					=	ᆿ
	5-Mar-17 64- ion-17 6-Day-17	Bore covered																													≢	\equiv
44334	5-Sup-39 11:35 2-Duc-09 11:45 10-Fab-10 1010 17-May-10 1135	sore course		3700	20.2 0.007 25 <0.01 0.002		0.634	<0.001	0.0005	<0.001 0.004 <0.005	40.001	5.32 <0.05	<0.002	0.787	0.001	<0.01	0.223	<0.0001	7.47 3340	45 102 30 149	504	5	35.8 655 25	ব	d	933	933	33.7 0.02 0.14 37.6 2.51	<0.01	<0.01	<0.01	1770
	17-May-16 1132 31-Aug-10 945 15-Nov-10 1130 3-Mar-11 1100 14-Jan-11 1000 15-Nov-11 1000 3-Aug-12 1040 23-Sep-11 1000 3-Aug-12 1040 13-Sep-12 1040 13-Sep-12 1050 3-Aug-12 1050	Bore cowned	8.5	2720	pty, no sample available 17																											ᆿ
	9-Mar-11 1100 14-Jun-11 1000	13.10 13.5 27.79 28.2	57 7.9 26 7.7	1385	24 1.04 0.005 18					0.003	0.226	14.5	0.165	1.05	0.008		3.63	<0.0001	8.76 1280	23 36	279	15	16.6 203 9	ત	100	552	547	16.8 0.72	<0.01	0.06	0.06	=
	29-Sep-11 1050 15-Nov-11 1030	30.78 31.2 54.51 54.5	25 7.9 98 8.05	2450 2800	17.3 <0.01 0.005 23.1		0.502	<0.001	0.0001	0.002 0.004	0.008	2.29	<0.004	0.738	0.001	<0.01	0.795	<0.0001	8.01 3330	47 104 29 81	552	4	25.3 530 21	ব	et .	931	931	34 1.82 0.04	<0.01	0.04		1740
	22-Jun-12 1040 12-Sep-12 1000	15.42 15.1 15.13 15.0	89 8.2 90 8.14	1150 2590	18.4 18.1 <0.01 0.002		0.325	⊲0 001	0.0031	<0.001 <0.001	0 033	0.33	<0.001	0.056	0.006	<001	0.539	<0.0001	83 2770	29 74	549	5	31.6 420 16	d	d i	9230	1000	328 193 4001	<0.01	01		1540
	7.har-49 641 18-Mar-13 950 9-34-13 1200	15 40 15 1 15 06 15 0			22.2 <0.01 0.004		0.396	⊲ 0 001	<0 0001	40 001 40 001	0 003	2.7	<0.001	0 122	40 001	<0.01	0.834	<0.0001	81 3280	29 128	520	5	36.2 545 27	d	ct.	847	847	329 344 015	<0.01	<0.01		1830
	6.5an.43 1040 30.6fm.44 1040	45.43 45.0	20 746	665	17.4 ×0.01 0.002		A 987	×0.004	0.0047	×0.004 ×0.008	0.047	200	0.000	0.033	0.004	20.04	1.52	×0.0001	7.5 0%	56 17	86	3	9.76 102 41	м	И	283	285	979 196 2010				514
	3-Sec-14 1120 12-Nov-14 1015 90-Eab-45 1010	Sore courses sore courses sore courses sore courses sore courses sore courses	79	2050 2730 2630	20.1 <0.01 <0.001 21.0 34.7 <0.01 0.005		0.422	40 001 40 001	0.0000	<0.001 d0.001	0.009	015	20.005	0.018	-0 001 -0 001	-0.01 -0.01	127	<0.0001 <0.0001	81 2010 840 7070	48 106 50 08	454 536	4	29.2 471 30	- d	-cl	995	995	338 727 002	40 05 40 05	0.02		9650 9435
	12-Nov-14 1015 95.8a-6.45 1010 22-May-15 1005 1-Sec-15 1010 23.8a-6.46 1010				17.2 12.9 0.01 0.007	<0.05	0.169	40 001 0 001	0.0007	<0.001 0.005	0.041	745	0.005	0.267	0.001	<001 <001	691	<0.0001	8 17 1360	26 52	202	3	14.4 173 16	d	st.	397	297	131 466 000	40 05 0 00	109	109	654
	10-May-16 1010 20-Aug-16 1015 11-May-16 1000 20-Esh-17 1000	Bore cowned	76 75 74	3120 3090	21.5 21.3 0.01 0.009	011	0.556	<0.001	0 0002	<0.001 0.008	0.016	4.24	0.002	0.577	0.003	<001 <001	0.217	<0.0001	7 61 3250	79 150	524	4	39.2 551 27	d	d	951	951	351 546 017	<0.01	<0.01	<0.01	1000
	11-Nov-16 1000 38-Eeh-17 1000 56-Jun-17 1005	Bore cowner	74 76 75	2450 2450	19.9 22.6 0.05 0.003	0.00	0.423	×0.004	0.0002	×0.001 0.007	0.005	205	×0.004	0.17	0.000	10.05	0.098	×0.0001	7.70 2540	17 82	AM	4	30 S 301 17	и	d	975	996	301 0.48 0.29	×0.06	0.00		6855
6349	21-Aug-17 000 5-Dec-17 1000 9-Sep-99 1500	Sore covered Sore covered sore covered	76	2570 2410	21.4 0.01 0.004 22.6 0.002	0.09	0.447	40 001 40 001	0.0006	<0.001 0.02 0.002 0.005	0.005	458	0.003	0.279	0.006	c001 c001	0.27	<0.0001	8 03 2670	45 68 70 94	560	<50 15	30.2 334 9 71.7 506 66.0	4	<1 1	9090 1	1090	314 128 03 226 241 247	40.05	<0.01	<0.01 1	1380
	2-Dec-09 1100 16-Feb-19 1000	9.89 103 9.87 103	22 7.51 20	3480	23.7 <0.01 <0.001					<0.005	0.001	<0.05	<0.001	1.14	0.004		0.101	<0.0001	7.46 3370	67 135	361	12	30.5 980 11	त	d	289	200	33.6 4.98	<0.01	0.93	0.93	≡
	17-May-10 1005 31-Aug-10 820 23-Nov-10 1330	9.96 102 9.91 102 9.86 10	29 7.13 24 7.86 19 7.27	5930 3260 2430	20.8 <0.01 <0.001 17.3 24.5					<0.005	<0.001	<0.05	<0.001	1.80	0.003		0.122	<0.0001	7.53 3890	106 198	480	4	42.5 1070 71.6	d	d	372	372	39.1 4.14	<0.01	131	=	=
	9-Mar-11 1040 14-Jun-11 920	10.02 10.1 9.62 9.9	35 7.6 2 7.6	2230 2420	23.5 0.22 0.001 18.7		-	-0.00	0.000	0.001	0.079	0.96	0.01	0.51	0.007		0.768	<0.0001	7.84 2420 7.86 3470	69 125	203	8	26.3 700 44 33 868 44	d	d	284	254	26.3 0.12	0.26	2.36	2.63	1540
	\$-00-07 10000	9.69 101 9.35 9.6	02 7.31 03 7.75	3020 2350	21.8 22.9 0.02 <0.001	E	0.317	<0.001	<0.0001	<0.001 0.002	0.021	1.47	0.003	1.96	0.006	<0.01	0.387	<0.0001	7.76 2760	80 131	295	10	27.9 785 28	4	et	321	321	29.1 2.25 3.4	0.14	1.05		1700
	29-Jun-12 1000 12-Sep-12 1000 7-Dec-12 0000 16-Mec-11 200	9.01 9.5 9.11 9.4 9.19 0.4	7.7 4 7.6 2 7.7	3090 3240	21.2 0.02 0.002 20.9	F	0362	d0 001	40 0001	4000 4000	0.01	514	0.005	248	0.003	49.01	0 191	<0.0001	7.72 3490	89 179		9	36.3 956 19	d	st.	413	413	356 092 392	0.14	0.02		2180
	48.Mar.41 930 9.3643 1225	934 95 933 98	7.5	3000 3000	20.4 0.05 0.001 18.5	E	AWT	AD 004	0.0004	2000 2000s	0.005	4.67	0.005	243	0.000	MON	A COR	×0.0001	7.76 9540	SA 17A	128	44	90.0 MW 4	A	A	175	125	17 484 8.0	0.00	A5.64	0.00 4	4895
	\$-56-13 1200 \$-5ec-13 1200 \$3.5ec-14 1200 \$-5ec-14 1100	931 96 931 96 955 98	a 773 a 78	3090 3120 3180	27.6 0.09 <0.001 49.5 0.09 <0.001	E	0.32	40 001 40 001	au 0001	cud01 0.002	0.04	156	0.001	1.5	0.005	4001	0.158	<0.0001	7.95 3400	85 161	290	10	20.6 815 8	- 4	ct ct	265	366	305 485 571	-0.0%	0.29	0.29	1500
	12-Nov-14 200 25-Feb-15 945 30-Men-15 900	962 99 967 100	6 75 30 76	3150 3090	21.1 21.4 0.05 <0.001	E	0.277	<0.001	0.0001	<0.001 <0.001	0.036	2.26	0.003	12	0.004	<0.01	0 127	<0.0001	7.96 3220	106 152	323	10	32 1 853 3	d	d		342	31 182 056	0.03	01	013	1250
	5. U.S. (15 95) 5. Sep. 15 95) 22-Feb-16 950 15-May-16 950	9.23 ±0.0 9.97 ±0.2	98 74 96 74 90 75 27 74	3050	19.4 0.04 x0.001 21.4 0.02 x0.001 20.2	40.05 40.05	0.28 0.279	40.001 40.001	40 0001 40 0001	40.001 40.001	0.003	4 07 9 11	<0.001 <0.001	1.48	0.000 40.001	40.01 40.01 40.01 40.01	0.042	<0.0001 <0.0001	7.87 3120 79 3080	116 147 104 142	129 334	12 10	30.5 688 c1 30.4 816 c1	/I /I	et et	372 284	372 254	26.8 9.54 1.09 28.7 2.82 4.34	40.05 0.19	0.03 <0.01	0.03 <0.01	2000 1880
	11-Nov-16 940	979 101	n 74 12 75	2010	21.1 0.03 ×0.001 21.2	0.06	0.334	AD 004	-0 000s	20.000 ×0.000	0.008	444	0.004	194	0.000	20.04 20.04	0.104	×0.0001	7 50 2000	122 150	336	46	32 4 844 4	А	A	547	317	20.2 466 3.02	0.07	6.2	0.27	1565
	5-Mar-17 955 14- line-17 1000	987 103	20 75 34 75	2710 2730 2640	20.7 0.00 <0.001 10.0 0.01 c.001	40.05	0346	40 001 40 001	40 0001 40 0004	<0.001 <0.001	-0.001 0.094	966	<0.001 <0.004	2.39	40 001	<001 <001 <001 <001	0.039	<0.0001	7.53 2940	84 126 91 142	295	13	27.3 690 <1	4	et et	310	310	28.9 2.65 6.99	40.05	0.07	007 2	2210
901460 GW901460	6-Dec-17 1000 19-Dec-08 900 19-Jan-29 9494	9.94 10.2 15.38 15.1 95.53 95.1	77 75 80 80%	2720 covered covered	20 1																										=	\equiv
	34. key.47 4000 \$-Dac-17 1000 19-Dac-08 200 15-Jan-09 1414 2-Mar-09 1320 \$-Agr-11 1410 14-Jan-11 1120 25-Sep-11 1220 15-Jan-09 1320	19.73 20.1 15.18 15.1	to Bore	covered covered																											=	ᆿ
	14-Jun-11 1120 20-Sep-11 1230 15-Dec-11 1130	15.00 15. 94.07 15.	45 Bore 45 Bore																							=	=			_	=	=
	15-Dec-11 1130 2-Apr-12 1230 20-Jan-12 1240 12-Sep-12 1205 7-Dec-12 1015 18-Mar-13 1045	54.87 55.2 54.74 55.1	29 Bore 16 Bore	covered																											=	≡
	7-Dec-12 1045 18-Mar-13 1045	17.66 19.4 14.56 14.1	DE Bore	covered																												\equiv
	5-5an-14 1000 9-5an-14 1000 9-5an-14 1000	14 50 14 5	22 Bore	covered covered covered																						=					=	\equiv
	93.Mov.15 1230 1-Sep-15 1120	14 20 14 E	13 BON 54 BON	Covered																											≢	ᆿ
	10-Mare-16 1235	14 36 14 3 14 36 14 3	70 5076	COVERED			H		=																	=	=				=	=
	11-May-15 1740 1-May-17 1300 16-Jun-17 1300	14.28 14.3 14.24 14.6	70 Bone 26 Bone 13 Bone	covered covered														П								=			П		=	ᆿ
45001	14-Jun-17 1300 4-Dun-17 1300 4-Dun-77 1310 17-May-16 1000 21-Jun-18 1000 22-Nov-10 1345 3-Mar-11 200 41-Jun-19 100 41-Jun-19 100 41-Jun-19 200	9.10 9.2 9.10 9.2	D Bore	covered covered																											=	ᆿ
	23-N00-10 1345 3-Mar-11 920 14-Jun-11 910	9.05 9.1 8.95 9.0	S 80%	covered covered																											垂	\equiv
	29-Sep-11 910 15-Dec-11 920 3-Arr-12 915	8.86 8.9 8.86 8.9	25 Bone 25 Bone 27 Bone	covered covered																											=	\equiv
	29-Jun-12 920 12-Sep-12 900	8.52 8.6 8.39 8.4	2 Bore 19 Bore	covered																												\equiv
				COVERED COVERED COVERED				=	=				=													=	=			_	=	=
	6-Sep-13 920 6-Sep-14 841	8.33 8.4 8.47 8.5	7 B016 7 B016	COVERED																											=	=
	5-Sep-13 920 5-Sep-14 540 12-Nov-14 920 22-Feb-15 545 93-Mex-15 920 1-Sep-15 920	8.65 8.7 8.71 8.8	5 Bore 4 Bore	covered																											=	ᆿ
	10-May-16 850	889 89		covered covered			H		=																	=	=				=	=
	11-Nor-16 865 88.76-5-7 903 14-3en-17 900 14-3en-17 900 15-3en-17 910 25-3en-17 910 25-3en-17 910 25-3en-17 910 15-3en-12 1115 15-0e1-12 800 17-3en-12 1115 15-0e1-12 800 17-3en-13 113-0e1-12 800 17-3en-14 800 17-3en-14 800 17-3en-14 115 5-3en-14 115 5-3en-14 115 5-3en-15 1100 17-3en-14 115 5-3en-15 1100 17-3en-15 1100	8.75 8.8 8.76 8.8 9.70 8.9 8.20 9.00 9.00 Bore covered Bore covered Bore covered	g Bore 0 Bore	covered																						_	_				=	=
Ivanhoe 3709	21-Jan-11 910 22-Sep-11 1100	BOLE CONLEC	7.05	4420 4937	18.5 20.1 25.5 0.57 0.011		0.314	<0.001	0.0000			Š	0.007	0049	0.003	0.00	4.15	-0.0004	70 850	128 232	846	15	62.8 1400 100		-,	767	767	55.9 4.94 <0.01	0.00	6.12		3220
	11-34-12 1115 11-0c1-12 850	Bore cowned	7.29 7.08 6.95 6.99 7.03 6.9	4480 5570	17.8 19.2 0.01 0.001		0.294	<0.001	<0.0001	<0.001 <0.001	0.034	3.36	0.004	0.033	0.002	<0.01	1.93		7.76 6550	157 235		15	67.8 1710 142	ব	d	549	849	68.2 0.28 0.02	0.05	0.47		3560
	11-Apr-13 900 11-Sep-13 830	Bore cowned	6.99 7.03	5450 5460	21.4 <0.01 0.001 20.2 0.07 0.003		0.261	<0.001 <0.001	0.0004	<0.001 <0.001 0.001 <0.001	0.021	0.77 4.52	0.006	0.016	<0.001 0.002	<0.01 <0.01	4.7	<0.0001	7.54 5960 7.6 6200	142 225 147 217		19	56.5 1300 97 64.2 1420 96	d d	<f =<="" td=""><td>783 831</td><td>783 831</td><td>54.3 1.97 <0.01 58.7 4.48 <0.01</td><td><0.01</td><td>2.69</td><td></td><td>3440 3660</td></f>	783 831	783 831	54.3 1.97 <0.01 58.7 4.48 <0.01	<0.01	2.69		3440 3660
	5-Jun-14 220 17-Sep-14 230 13-Dec-14 1215	Bore cowned Bore cowned	6.9 6.9	5100 5860 6250 6220	15 20.1 0.02 0.002		0.256	<0.001	0.0002	<0.001 <0.001	0.022	1.1	0.003	89	0.001	<0.01	1.1	<0.0001	7.33 6360	154 240	825	16	63.7 1660 101	ব	d	931	931	67.5 2.91 0.02	<0.01	0.62	0.62	3630
	5-Mar-15 1100 27-Mars-15 1040	Bore course Bore course	6.9	6220 5330	22.9 <0.01 <0.001 20.4		0.312	<0.001	0.0001	<0.001 <0.001	0.014	1.92	<0.001	0.042	0.003	<0.01	0.828	<0.0001	7.21 6100	158 240	926	11	68.2 1560 102	ব	d	898	898	64.1 3.1 0.03	0.07	0.38	0.45	3580
	27.Mm-15 1040 16-Sep-15 930 22-Mar-16 940 17.Mm-16 1000	BOLE CORLEG	7 73	6020 6020	21 1 <0.01 0.003 10	0 18 0 17	0.24 0.282	40 001	-0 0001 -0 0001	0 001 40 001	0.065	169	0.003	0.025	0.002	4001 4001	0.214	<0.0001	7.4 5140	163 220	807	10	61 7 1540 96	<1 <1	<1 <1	938	938	642 2 003	<0.00	05	05 Z	3580
	93-May-16 900 1-May-17 915 91-Jan-17 1100	Tag Tag	0 69 0 75	5560 4510 5400	22.6 23.5 48.5	F	Ħ	=	=		=		=		F	_	F	Ħ		$\vdash \vdash$	ŧŦ	=	+ $=$	Ħ	Ŧ	Ŧ	⇉	+ $=$	Ħ	7	Ŧ	∄
Warren	13-Dec-17 910	The Tie	7 7	5420 5390	20 0.08 0.094 21.3	0.17	0.050	40.004 40.0004	0.0001	0.001 -0.001	0.35	27.2	0.036	0.073	0.006	-001 0m	534	5260	7.50 5500	600 275 572 /*	53.9	1300	66.2 1330 69 108 <1 <1	et en	504	51.4	2.3	665 792 0.05	0.00	121	123	1080
	3.0	16.73 17.3	8.03	5770	25.9 <0.01 <0.001	-20			30005	0.01	<0.05	<0.001	0.00	20.00H	-201	<0.005 <0.0001	8.16	3220	152 257 48 280 157 288	924 11	52.9	16260	120 रो रो	ži	501 354	56.1	2.96	0.07 1.83	1.9		#	\equiv
	3-hours 1405 3-hou-ho 1405 16-Feb-10 1225 17-May-10 1220 21-Aug-10 1220 15-Nov-10 1221 5-Mar-11 1000 14-Jan-11 1100 21-Sep-11 210 6-Jan-12 1000 3-Agr-12 0040	BOSE CONTROL	7.8 8.43 793 WSB	4410 er in garn in	16.8 <0.01 <0.001 19.9 0.0y core	E			20005	0.001	cu.05	<u.001< td=""><td>UUI</td><td><0.001</td><td></td><td>-GUUS -GUOON</td><td>/.74</td><td>5100</td><td></td><td>656 7</td><td>6u 2</td><td>1040</td><td>en d d</td><td>497</td><td>49/</td><td>20.7</td><td>234</td><td>u.02 1.31</td><td>1.33</td><td>_</td><td>#</td><td>=</td></u.001<>	UUI	<0.001		-GUUS -GUOON	/.74	5100		656 7	6u 2	1040	en d d	497	49/	20.7	234	u.02 1.31	1.33	_	#	=
	8-Mar-11 1020 14-Jun-11 1100 21-Sen-11 010	Bore covered sore covered	7.76 7.85	4200 3870 3200	25 0.18 <0.001 17.5 19.7 0.08 20.004	0177	40.004	<0.0001	<0.001 <0.001	<0.002	0.29	<0.001	0.01	0.000	gn me	0.006 <0.0001	7.96 p.nn	5060	136 262	601 11 486 ^	54.6	1380 107n	92 21 3	514	514	51.5	3.06	0.02 1.06	1.05	_	#	=1
	6-Jan-12 1030 3-Apr-12 0040	Sore cowred Sore cowred sore cowred	7.92 7.55	2745 3150	23.8 22.2 0.05 <0.001	0.251	<0.001	<0.0001	<0.001	<0.001 0.003	0.06	<0.001	0.01	0.001	<0.01	0.008 <0.0001	8.14	3540	94 201	493 6	42.4	1030	20 cl cl	452	462	40.2	2.65	0.16 <0.01 0.04	0.04	2230	#	ᆿ
	29-Jun-12 1230 39-Sen-17 0550 7-Dec-12 1210	BOLE CONLEG	7.66	3070 3730 3410	22 0.84 0.004 26.8	0.084	×0.006	0.0004	0.002	0.001 0.005	n 90	×0.001	0.006	0.000	×0.04	0.001 -0.0000	804	4200	71 199	A61 65	45.5	toto	96 24 24	613	513	41 E	1 67	20.01 20.01 0.42	0.40	2260	#	=
	93.5a19 1995 7-Date-12 1210 18-Mar-12 1215 9.3a19 1115 5-Sam-13 1115	BOTE COMPED BOTE COMPED	8.2	3470	24.3 0.72 <0.001	0.147	40 001	<0 0001	<0.001	<0.001 0.005	0.84	<0.001	0.022	0.002	<0.01	0.023 <0.0001	8.04	2900	75 194	47E 10	40.6	935	M ct ct	439	439	27	4.92	0.04 <0.01 0.04	0.04	2250	#	=1
	13-Nov-14 1240	Sore covered sore covered																							=		=				#	∃
	20-May-15 1-Sep-15 1-Sep-15 10-May-16	Bore cowned		E		E											E		==		Ħ		\pm		=	=	=				#	Ⅎ
		Bore course Sore course	H	F	HF	F	Ħ	=	=		=		=		Ħ	==	F	Ħ		⊨F	ŧΤ	目	$+$ \mp	Ħ	$= \mathbb{T}$	Ŧ	7	$+$ \mp	Ħ	7	==	╡
44677	14-Jun-17 6-Dan-17	Bore course	74	5380	96.9	E																			=	=					丰	∃
49077	2-Dec-09 1320 16-Feb-10 1243 17-May-10 1305	No Access sore course	ŧ	Ė	Bore con	ened Could	not sample	==	=1		=1		==		E		E				Ħ	_1		Ħ	_#	Ħ.	=		Ħ	_	#	=1
	34 08/2010 1125 15 Nov-10 1245 3-Mpr-11 ****	Bore cowned		E	+	E	Ħ	=	╡		=	Ξ	=	Ξ	Ē		Ē	Ħ		$\vdash \vdash$	H	=	$+$ \mp	Ħ	Ŧ	Ŧ	3	$+$ \mp	Ħ	7	#	∄
	14-Jun-11 1050 22-Sep-11 1250	SOF COAFE		E		E																				\Rightarrow					#	\equiv
	15-Dec-11 1200 2-Apr-12 1300 26-Jun-12 1330	BOTE COMPED BOTE COMPED	7.1 7.2 7.1	4080 3810 4370	24 25.2 <0.01 <0.001 18.1	F	0.462		<0.0001	<0.001 <0.001	0.004	20.05		<0.001	<0.001	<0.01	0.019			202 253		6	54.2 1380 Bf	d			524	51.1 2.91 <0.01	<0.01	3.18	3.18 2	
	12-Sep-12 1230 7-Dec-12 1115	Sore course sore course	7.1 7.1	4320	22.8 <0.01 <0.001 22.9		0.406	<0.001	40.000H	<0.001 <0.001	0.002	40.05	<0.001	<0.001	40.001	-0.01	0.013	<0.0001	7.53 4880 7.42 4910			6	47.1 1280 72 51.7 1280 77	d	el .		586	493 231 006 476 407 2001	40.01	3.01		2750
	9.36.13 1130 6-Sep-13 1140	Sore covered	83 766	4420 4420	17.1 23 <0.01 <0.001	E	0.466	<0.001	40 0001	<0.001 <0.001	0 009	<0.05	<0.001	0.002	<0.001	e001	0.052		7.52 4920	180 237	510	5	51 2 1200 73	d	d	526		465 478 002				2040
	5-Am-14 1055 3-Sep-14 1430 13-Nov-14 1250	BOLE CONLEC	7 71 72	4650 4630	16.8 21.2 n.m 20.001 24.9	E	0.461		v0.0001	-0.001 -0.00E			×0.004			×0.04	0.063			104 365			60 9540 20					426 17 0.01	×0.04		36 3	2900
	25-Feb-15 1320 25-Men-15 1355	Bore course sore course sore course	72	4620 4640	26.2 0.02 <0.001 35.1	Ę	0.455	40 001	40 0001	40 001 40 001	0.004	<0.05	<0.001	0.002	0.001	4991	0.027	<0.0001	7.74 4870	192 243	501 434 483		51.5 1250 83		d	559	559	482 335 004	0.01	36	261 2	2010
	188-77 18-80-77 18-80-87 18-80	Sore covered	74 72 71	4750 4820	25.5 <0.01 <0.001 25.5	012	0.434	40 001	<0 0001	40 001 40 001	0.003	005	<0.001	<0.001	40 001	<001 <001	0.009	<0.0001	7.72 4970				50.2 \$050 23 49.9 1260 54		d	483	410	46.9 307 001	<0.01 0.00	39	39	1260
	95-889-16 1310 95-8en-16 1320 15-Men-17 1325 16-1-17 1330 95-8en-17 1330	Bore course	71	#500 #500	23.5 25.2 0.03 <0.001	014	0.445	40 001	-0 0001	<0.001 <0.001	0.01	20.05	0.003	0.007	0.007	4001 4001	0.42	<0.0001	7.85 4000 7.37 5010	175 217	490	4 6	49.2 1100 79	A d				480 K96 2004 436 602 011	40.00	366	366 3	3035
	M. Jan. 17 1330 M. Jan. 17 1330 6 Dec. 17 1330	Bore course	71 72	4730 4750 4610	99.6 19.6 ×0.01 ×0.001	0.12	0.451	40.00d	-0.0001	40.001	0.004	×0.05	0.001	0.005	-0.001	4004 4004	0.072	40.0001	7.65 4960	165 230	490	Z10	49.9 1130 20	-	d	605	605	454 473 40.01	-0.04	3.26		2080
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