



**Havilah Resources Ltd and Innovation and Science Australia (Taxation)
[2020] AATA 933 (16 April 2020)**

Division: TAXATION AND COMMERCIAL DIVISION

File Number(s): **2016/6884**

Re: **Havilah Resources Ltd**

APPLICANT

And **Innovation and Science Australia**

RESPONDENT

DECISION

Tribunal: **Deputy President P Britten-Jones**

Date: **16 April 2020**

Place: **Adelaide**

The decisions under review are affirmed.

.....[Sgnd].....

Deputy President P Britten-Jones

CATCHWORDS

TAXATION – research and development tax offset – whether claimed activities are ‘core R&D activities’ within the meaning of Div 355 of the Income Tax Assessment Act 1997 (Cth) – mining related activities – where activities involved standard and routine hydrogeological drilling, sampling and pumping tests and subsequent routine groundwater modelling tasks – where activities involved standard and routine hydrogeological and geotechnical investigations into the feasibility and optimisation of a tailings storage facility for a proposed mining development – where activities came within the exclusion in s 355-25(2)(b) for prospecting, exploring or drilling for minerals - where activities came within the exclusion in s 355-25(2)(f) for activities associated with complying with statutory requirements or standards – consideration of the words ‘experimental activities’, ‘deposits’ and ‘new knowledge’ – decisions under review affirmed

LEGISLATION

Income Tax Assessment Act 1997 (Cth)

Industry Research and Development Act 1986 (Cth)

Mining Act 1971 (SA)

Mining Regulations 2011 (SA)

CASES

Alcan (NT) Alumina Pty Ltd v Commissioner of Territory Revenue (2009) 239 CLR

Docklands Science Park Pty Ltd and Innovation Australia [2015] AATA 973

JLSP and Innovation Australia [2016] AATA 23

Moreton Resources Limited v Innovation and Science Australia [2019] FCAFC 120

Moreton Resources Ltd and Innovation and Science Australia [2018] AATA 3378

Project Blue Sky v Australian Broadcasting Authority (1998) 194 CLR 355

SAS Trustee Corporation v Miles [2018] HCA 55

SECONDARY MATERIALS

Explanatory Memorandum for the Tax Laws Amendment (Research and Development)

Bill 2010

REASONS FOR DECISION

Deputy President P Britten-Jones

INTRODUCTION

1. The applicant (“Havilah”) is an exploration company which controls mining tenements in the north east of South Australia. Havilah engages in mining activities at various sites including Portia, Kalkaroo and Maldorky for gold, copper-gold and iron ore respectively.
2. The issues in this application for review relate to the research and development (“R&D”) provisions in Division 355 of the *Income Tax Assessment Act 1997* (Cth) (“the ITAA 1997”) and the associated provisions of the *Industry Research and Development Act 1986* (Cth) (“the IR&D Act”).
3. Havilah contends that, during the financial years ended 30 June 2013 and 30 June 2014, it engaged in activities in relation to the Portia, Kalkaroo and Maldorky sites for which it is entitled to receive a tax offset pursuant to Division 355 of the ITAA 1997 on the basis that they constituted ‘*R&D Activities*’ as defined in that Division.¹
4. The IR&D Act implements a scheme whereby R&D activities for particular income years are registered. Under that Act, the respondent is referred to as ‘*the Board*’. The Board is granted the power to make findings as to whether registered activities were, or were not, ‘*core R&D activities*’ or ‘*supporting R&D activities*.’ The Commissioner of Taxation is then bound by the Board’s findings for the purposes of the ITAA 1997.
5. In December 2015, the Board found that certain aspects of Havilah’s activities in the 2012/13 and 2013/14 income years were neither core R&D activities nor supporting R&D activities. Those decisions were confirmed on an internal review in November 2016.

¹ ‘*R&D activities*’ is defined as meaning ‘*core R&D activities*’ or ‘*supporting R&D activities*’. The definitions for these expressions are set out later in these reasons.

6. Havilah has applied to the Administrative Appeals Tribunal (“the Tribunal”) for review of the internal review decisions.

LEGISLATIVE SCHEME

The ITAA 1977

7. The relevant provisions of the ITAA 1997 are contained in Division 355. Section 355–1² provides that an R&D entity may be entitled to a tax offset for R&D activities. To be entitled to the tax offset, the R&D entity needs one or more notional deductions under the Division. The expression ‘*R&D entity*’ is defined in s 355–35. It includes a body corporate incorporated under an Australian law. It is not in dispute that Havilah is such an entity.
8. The object of this Division is set out in s 355–5 which provides:
- (1) *The object of this Division is to encourage industry to conduct research and development activities that might otherwise not be conducted because of an uncertain return from the activities, in cases where the knowledge gained is likely to benefit the wider Australian economy.*
 - (2) *This object is to be achieved by providing a tax incentive for industry to conduct, in a scientific way, experimental activities for the purpose of generating new knowledge or information in either a general or applied form (including new knowledge in the form of new or improved materials, products, devices, processes or services).*
9. Section 355–20 provides the definition for ‘*R&D activities*’. R&D activities are either ‘*core R&D activities*’ or ‘*supporting R&D activities*’. These expressions are further defined in s 355–25 which provides:
- (1) **Core R&D activities** are experimental activities:
 - (a) *whose outcome cannot be known or determined in advance on the basis of current knowledge, information or experience, but can only be determined by applying a systematic progression of work that:*
 - (i) *is based on principles of established science; and*
 - (ii) *proceeds from hypothesis to experiment, observation and evaluation, and leads to logical conclusions; and*
 - (b) *that are conducted for the purpose of generating new knowledge (including new knowledge in the form of new or improved materials, products, devices, processes and services).*

² All references to legislation are to the ITAA 1997 unless stated

- (2) *However, none of the following activities are **core R&D activities**:*
- (a) ...
 - (b) *prospecting, exploring or drilling for minerals or petroleum for the purposes of one or more of the following:*
 - (i) *discovering deposits;*
 - (ii) *determining more precisely the location of deposits;*
 - (iii) *determining the size or quality of deposits;*
 - (c) ...
 - (d) ...
 - (e) ...
 - (f) *activities associated with complying with statutory requirements or standards, including one or more of the following:*
 - (i) *maintaining national standards;*
 - (ii) *calibrating secondary standards;*
 - (iii) *routine testing and analysis of materials, components, products, processes, soils, atmospheres and other things;*
 - (g) ...
 - (h) ...

10. Section 355-30 provides the definition for 'supporting R&D activities':

- (1) **Supporting R&D activities** are activities directly related to core R&D activities.
- (2) *However, if an activity:*
- (a) *is an activity referred to in subsection 355-25(2); or*
 - (b) *produces goods or services; or*
 - (c) *is directly related to producing goods or services;*
- the activity is a **supporting R&D activity** only if it is undertaken for the dominant purpose of supporting core R&D activities.*

The IR&D Act

11. Section 4 of the IR&D Act provides that the terms 'core R&D activities' and 'supporting R&D activities' have the same meaning as in the ITAA 1997.
12. Part III of the IR&D Act deals with functions relating to the R&D tax offset. Division 2 of that Part specifically focuses on the registration of an R&D entity for R&D activities. Under that Division:

- (a) the Board may register an R&D entity for R&D activities conducted during an income year;
 - (b) the Board may make findings about the nature of an R&D entity's activities both before and after registration; and
 - (c) those findings are binding on the Commissioner of Taxation for the purposes of any entitlement of the R&D entity to a tax offset under Division 355 of the ITAA 1997 for these activities.
13. Section 27A of the IR&D Act deals with registering R&D entities for R&D activities. Section 27F(1) provides that the Board may conduct one or more examinations of all or part of an R&D entity's registration under s 27A for an income year for the purposes of making one or more findings under s 27J(1) (set out below). The note under s 27F(1) explains that a finding under s 27J(1) will support the entity's registration or cause the variation of that registration.
14. Section 27J of the IR&D Act provides:
- (1) *The Board may make one or more findings to the following effect about an R&D entity's registration under section 27A for an income year 'the registration year':*
 - (a) *that all or part of a registered activity was a core R&D activity conducted during the registration year;*
 - (b) *that all or part of a registered activity was not an activity of a kind covered by paragraph (a);*
 - (c) *that all or part of a registered activity was a supporting R&D activity conducted during the registration year and in relation to:*
 - (i) *one or more specified registered core R&D activities; or*
 - (ii) *one or more specified core R&D activities for which the entity has been registered in an earlier income year;*
 - (iii) *one or more specified core R&D activities yet to be conducted for which the entity could be registered in the registration year if those activities were conducted during the registration year; or*
 - (iv) *several specified core R&D activities, each covered by subparagraph (i), (ii) or (iii);*
 - (d) *that all or part of a registered activity was not an activity of a kind covered by paragraph (c).*

Note 1: A finding is reviewable (see Division 5).

Note 2: The Board could make a finding under paragraph (b) if, for example, the Board has insufficient information to make a finding under paragraph (a). Similarly, the Board could make a finding under paragraph (d) if it has insufficient information to make a finding under paragraph (c).

- (2) *If the Board makes a finding under subsection (1) in relation to the R&D entity's registration, the Board may specify in the finding the times to which the finds relates.*

Example: A finding under paragraph (1)(a) could specify the times during the registration year that a registered activity was a core R&D activity.

- (3) *This section has effect subject to section 32B (findings cannot be inconsistent with any earlier findings).*

15. Division 5 of Part III of the IR&D Act deals with review of decisions of the Board. Section 30D provides for a process of internal review. Section 30E provides for external review by the Tribunal of internal review decisions.

PROCEDURAL HISTORY

16. On 13 May 2014 Havilah applied to the respondent to register activities related to the Maldorky, Portia and Kalkaroo mining projects for the income year 2012/13. These claimed activities were registered by the respondent on 20 May 2014.
17. On 27 May 2015 Havilah applied to register similar activities for the income year 2013/14. The claimed activities were registered by the respondent on 31 May 2015.
18. In or around June 2015 the respondent initiated a compliance review of the registered activities for 2012/13. On 1 July 2015 KPMG acting on behalf of Havilah provided a significant amount of material to the respondent in support of the claimed activities at the three projects. On 3 August 2015 the respondent wrote to KPMG advising that the registration was considered to have a high risk of non-compliance with the eligibility requirements of the program. Havilah was then notified of a formal examination of registration under s 27F of the IR&D Act for some of the claimed activities which had been registered for the income years 2012 to 2014.
19. On 22 December 2015 the delegate of the respondent made a formal post-registration finding under s 27J of the IR&D Act that some of the claimed activities were not core or supporting R&D activities. Havilah requested an internal review of that finding but it was confirmed by a delegate of the respondent on 23 November 2016. On 19 December 2016

Havilah applied to the Tribunal for review of the internal review decision under s 30E of the IR&D Act.

ISSUES

20. The key issue before the Tribunal in this application is whether the claimed activities registered by Havilah for the income years 2012/13 and 2013/14 are core R&D activities as defined in Division 355 of the ITAA 1997. The respondent has raised issues as to:
- (a) whether the claimed activities were in fact carried out;
 - (b) whether the claimed activities were experimental activities;
 - (c) whether the claimed activities were for the purpose of generating new knowledge;
 - (d) whether the claimed activities were excluded under s 355-25(2)(b) as they were prospecting, exploring or drilling for minerals; and
 - (e) whether the claimed activities were excluded under s 355-25(2)(f) as they were associated with complying with environmental statutory requirements or standards.
21. Havilah has made claims with respect to its activities at three separate sites. It is convenient to first consider some of the legal and factual issues that may apply to more than one of these sites.

Water related issues

22. The removal of groundwater is a common issue facing those that wish to mine underground resources. This was particularly relevant to the disputed activities in issue at Portia and Maldorky where it was necessary for Havilah to carry out hydrogeological investigations with respect to groundwater and proposed tailings storage facilities. Mr Hugh Middlemis, the respondent's expert, provided some general commentary about the hydrogeological investigations carried out by Havilah in his report dated 23 February 2018:³

³ Exhibit 26, Middlemis Report

It is the nature of all hydrogeological and modelling investigations into the opaque subsurface that site specific (exact) outcomes will be unknown. But in this case, there was adequate information available prior to 2012 for the general outcomes to be broadly understood. Furthermore (and as explored further below):

- *the hydrogeological and geotechnical investigations applied in this case involve standard methods, not innovative techniques, for investigating routine tasks; in other words:*
 - *The routine investigations are more a case of resolving mining project-related questions with a site-specific data, rather than investigating a hypothesis; routine questions in this case include:*
 - *can a set of groundwater pumping wells be constructed and utilised to dewater the proposed open pit mine, and/or to meet the mining project water supply demand?*
 - *can a set of injection wells be constructed to dispose of excess water from the mining operation?*
 - *can geotechnical modelling be used to develop a cost-effective design and operational management plan for the tailings storage facility?*
 - *can a groundwater model be developed to investigate cost-effective options for pumping and injection wellfield designs and operational management, and for the water-related aspects of tailings storage facility design and management?*
 - *can all of the above investigations be used to provide information on the water-related impacts such that it would support the statutory mining project approvals process?*
- *some activities were related to the exploration of minerals (e.g. the gold deposit at Portia);*
- *the outcomes of the activities were subsequently applied to support the statutory mining project approvals process (mining lease proposals were submitted and/or approved in 2014 for the Portia, Kalkaroo and Maldorky projects, as indicated in the Havilah Resources Annual Report (2014); Tab 5/150).*

The subsurface environment is complex and heterogenous, difficult to directly observe, characterise or measure. Contrary to engineering systems which are generally closed, relatively simple and well defined or measured, hydrogeologic systems are open, complex and partially defined (Neuman and Wierenga, 2003).

As groundwater systems are open to influence by geology, topography, vegetation, climate, hydrology and human activities, uncertainty affects our ability to accurately measure or describe the existing or future states of these systems. Hydrogeological investigations are routinely undertaken to obtain site-specific data to characterise the aquifer system, including drilling boreholes, conducting pumping tests and analysis, and then using that data to develop groundwater models, which apply established scientific and mathematical principles. Simulation modelling is used to investigate current and future system states and thus support decisions for groundwater resource assessment, management and policy.

The Australian Groundwater Modelling Guidelines (AGMG; Barnett et al. 2012) provide information on simulation modelling. Groundwater models are simplified scientific constructs that are continuously refined to investigate new evidence, conceptualisations and uncertainties, and the effects of management options on future eventualities. While models cannot predict the future with total (100%) confidence, decision makers and stakeholders use models results and estimates of the effects of related uncertainties, exercising their judgement to decide what level of risk is acceptable for a specific context.

The meaning of experimental activities in s 355-25(1)

23. The explanatory memorandum for the *Tax Laws Amendment (Research and Development) Bill 2010* provides at paragraph 2.11:

The existence of core R&D depends on establishing that an experiment (or set of related experiments) is taking place. An experiment entails investigating causal relationships among relevant variables to test a hypothesis or determine the efficacy of something previously untried. Experiments may take place in a range of settings, from a separate laboratory to an otherwise normal production run.

24. The construction of the definition of core R&D activities in s 355-25(1) of the ITAA 1997 (in particular, the words ‘experimental activities’ in the opening line of the sub-section) was considered by the Full Federal Court in *Moreton Resources Limited v Innovation and Science Australia* [2019] FCAFC 120. The Full Court said:

[148] In our respectful opinion, the words “experimental activities” in the opening line of s 355–25(1) have very little, if any, work to do beyond reflecting the type of activities described in paragraphs (a) and (b) of the subsection. Paragraphs (a) and (b) contain a detailed description of activities. Activities must meet the descriptions in both paragraphs to satisfy the defined expression “core R&D activities”. The word “experiment” is used in paragraph (a): this paragraph refers to an outcome that can only be determined by applying a systematic progression of work that, among other things, “proceeds from hypothesis to experiment, observation and evaluation, and leads to logical conclusions”. Given the detail and content of the description in paragraphs (a) and (b), it is difficult to envisage activities that would meet the description in paragraphs (a) and (b) but would not be considered “experimental activities”. This is not to say that the word

“experimental” in the opening line of the subsection is wholly superfluous. It is, at least, descriptive of the types of activities that are described in paragraphs (a) and (b).

...

[151] In our respectful opinion, the Tribunal misconstrued the words “experimental activities” in the opening line of s 355–25(1) by treating these words as not covering activities having the purpose of generating new knowledge with respect to the application of an existing technology at a new site (at least in circumstances such as those of the present case). ... The text of the provision, whether one looks at the words “experimental activities” or the text of paragraph (b), does not impose any such limitation. Paragraph (b) refers to experimental activities “that are conducted for the purpose of generating new knowledge (including new knowledge in the form of new or improved materials, products, devices, processes or services)”. These words are capable of applying, depending on the circumstances, to activities that are conducted for the purpose of generating new knowledge with respect to the application of an existing technology at a new site. ...

...

[153] ... The object of Div 355 of the ITAA 1997 is to encourage industry to conduct research and development activities that might otherwise not be conducted because of an uncertain return from the activities, in cases where the knowledge gained is likely to benefit the wider Australian economy (s 355–5(1), set out above). The object is to be achieved by providing a tax incentive for industry to conduct, in a scientific way, experimental activities for the purpose of generating new knowledge or information “in either a general or applied form (including new knowledge in the form of new or improved materials, products, devices, processes or services)” (s 355–5(2)). At least in circumstances such as those of the present case, this object is capable of being served by activities that have the purpose of generating new knowledge with respect to the application of an existing technology at a new site.

[154] ... In summary, depending on the circumstances, paragraph (b) [of s 355–25(1)] is capable of applying to activities having the purpose of generating new knowledge with respect to the application of an existing technology at a new site.

New knowledge

25. The requirement in s 355-25(1)(b) that the core R&D activities are experimental activities that are conducted for the purpose of generating ‘new knowledge’ reflects the statutory object in s 355-5(1) of generating knowledge benefits through activities that might otherwise not be conducted ‘in cases where the knowledge gained is likely to benefit the wider Australian economy’. The starting point in statutory construction is the legislative

text⁴ which is to be read in its context and with its purpose in mind.⁵ It is important to understand the meaning of new knowledge in the context that the knowledge gained is likely to benefit the wider Australian economy. Further, new knowledge must be construed in the specific context in which it appears, namely, as a feature of 'experimental activities'. In order to satisfy the second element of core R&D activities in s 355-25(1)(b) one needs to establish more than the generation of new knowledge. It is not merely the generation of new knowledge that gives rise to an entitlement to the tax incentive; there must be experimental activities conducted in a scientific way for the purpose of generating new knowledge.

26. As to whether the claimed activities were for the requisite purpose of generating new knowledge, Deputy President Frost said in *JLSP and Innovation Australia* [2016] AATA 23:

[52] However, I do not agree with the respondent's submission that an entity only holds "the purpose" referred to in s 355-25(1)(b) if the entity holds that purpose as the dominant or prevailing purpose. ... the purpose of generating new knowledge does not have to be the purpose that outweighs all the others. Instead, I consider that the purpose of generating new knowledge must be more than an insubstantial purpose; it must be substantial enough to enable the activity to be accurately characterised as conducted for that purpose. That will sometimes involve questions of degree which may be difficult to resolve. Nevertheless, it needs to be recognised that the purpose of generating new knowledge may be a substantial purpose even if at the same time other substantial purposes also exist. And the fact that an alternative purpose for the activity may be identified as a substantial purpose does not necessarily lead to a conclusion that the purpose of generating new knowledge may not also be identified in that way.

Complying with environmental statutory requirements or standards

27. The respondent submits that most of the claimed activities were activities associated with complying with statutory requirements or standards and therefore come within the exclusion in s 355-25(2)(f). As to whether the claimed activities were associated with

⁴ *Alcan (NT) Alumina Pty Ltd v Commissioner of Territory Revenue* (2009) 239 CLR 27 at [47] (Hayne, Heydon, Crennan and Kiefel JJ)

⁵ *Project Blue Sky v Australian Broadcasting Authority* (1998) 194 CLR 355 at [78] (McHugh, Gummow, Kirby and Hayne JJ); and *SAS Trustee Corporation v Miles* [2018] HCA 55 at [20]; (2018) 92 ALJR 1064 at 1071 (Kiefel CJ, Bell and Nettle JJ)

complying with environmental statutory requirements or standards, the use of the words 'associated with' suggests the exclusion is to have a broad operation.⁶

28. The *Mining Act 1971 (SA)* regulates a wide range of activities, from initial exploration to locate potentially economic mineral deposits, through to the extraction of the mineral and its production into a useable commodity. It also includes the rehabilitation of the mine site once mining ends. Under s 34 of the *Mining Act*, the Minister may grant a mining lease. An application for a mining lease must be accompanied by a mining proposal which specifies the proposed mining operations and sets out an assessment of expected environmental impacts and proposed measures to deal with those impacts.⁷

29. There are further statutory requirements in the *Mining Act* which provides at s 70B(1) that 'the holder of a mining tenement must not carry out mining operations unless a program that complies with the requirements of this Part is in force for those operations.' Section 70B(2) provides that a program must specify the mining operations and set out such other information as may be required by a condition of the tenement or by the regulations. The *Mining Regulations 2011 (SA)* at s 30 require a statement of environmental outcomes that address issues including surface and groundwater quality and quantity. Regulation 65(7) provides that the Minister may determine, by notice in the Gazette, the information that must be provided. The Ministerial Determination 005⁸ first gazetted on 12 July 2012 sets out the minimum information required to be provided in a program for environment protection and rehabilitation (PEPR) for a mineral lease which included information relating to mine dewatering, process water management and tailings storage facilities. This information is a statutory requirement because the source of the requirement is s 70B of the *Mining Act*. More detailed guidelines for miners were provided in the Minerals Regulatory Guidelines prepared by the Department of Primary Industries and Resources South Australia.

⁶ See *Moreton Resources Ltd and Innovation and Science Australia* [2018] AATA 3378 at [211] which was not subject to the appeal

⁷ *Mining Act 1971 (SA)* s 35

⁸ Exhibit 16, *Ministerial Determination 005*

30. The evidence of Dr Giles was that Havilah would work on feasibility studies and permitting activities 'in parallel'.⁹ Even if the claimed activities were carried out for such a dual purpose, the exclusion would be engaged. The test is not whether the activity is solely or even primarily carried out to comply with statutory requirements or standards; the test is whether the activity is 'associated with' complying.
31. Mr Middlemis noted in his report¹⁰ that in order for mining projects to achieve statutory approval, it is necessary for site specific investigations and modelling to be undertaken. For example, a statutory obligation to provide a program as to how a mine will be dewatered will mean that dewatering activities carried out will be excluded from core R&D activities because they are activities associated with complying with statutory requirements or standards.

Lack of documentation

32. There was no written expression by Havilah of any hypothesis until May 2014 when Havilah submitted its application to register R&D activities. Havilah gave evidence that it was a small company with only about eight employees at the time often operating at a remote site and therefore did not express the hypothesis in writing at the time that it was postulated. Dr Giles stated further 'that a lot of the hypotheses are in our heads' and 'at the end when we draw our conclusions or we get an expert to write a report, that's when it becomes documented.'¹¹
33. Despite the above statement from Dr Giles, Havilah did not in fact document any hypothesis in the written reports it obtained.¹² If there was an hypothesis in the terms expressed then one would expect it to have at least been referred to in the reports generated as part of the core activities.
34. The lack of documentation evidencing an hypothesis creates a real evidentiary difficulty for Havilah because it is required to establish a systematic progression of work that

⁹ Transcript p 60 line 30 Giles XN, p 240 lines 4 to 15 and p 241 lines 8 to 11 Giles XXN

¹⁰ Exhibit 26, Middlemis Report at 1.3.4 p 11

¹¹ Transcript p 70 Giles XN

¹² These reports are considered in more detail below

proceeds from hypothesis to experiment in a scientific way. One would expect documentation recording the systematic progression of the activities undertaken. Further, in order to establish a systematic progression of work carried out in a scientific way, one would invariably require written evidence. This was the view taken in *Docklands Science Park Pty Ltd and Innovation Australia* [2015] AATA 973 when the lack of documentation proved fatal to the applicant's case. The Senior member in that case said at [63] that 'an applicant cannot succeed in establishing those requirements in the absence of detailed documentation recording the process of each activity as it develops.'

35. There is no express legislative obligation requiring the hypothesis to be expressed in writing, but there is a requirement that the outcome of the experimental activities 'can only be determined by applying a systemic progression of work that ... proceeds from hypothesis'.¹³ The meaning of 'systemic progression of work' is informed by the legislative object expressed in s 355-5 which says that the object of encouraging industry to conduct research and development activities is 'achieved by providing a tax incentive for industry to conduct, in a scientific way, experimental activities ...'. The inclusion of the words 'in a scientific way' suggests that the systematic progression of work should be recorded so as to achieve that standard.

THE DISPUTED R&D ACTIVITIES

36. Havilah's applications for registration of R&D activities for the 2012/13 year and for the 2013/14 year contain a list of the R&D activities with respect to the projects at Maldorky, Portia and Kalkaroo.
37. The disputed core R&D activities at Maldorky were described by Havilah as:
- (a) understanding hydrology of the Maldorky region and developing a process for ground water management; and
 - (b) securing fine-grained Maldorky tailings.
38. The disputed core R&D activities at Portia were described by Havilah as:

¹³ Section 355-25(1)(a)

- (a) hydrogeology of the Portia area basement rock aquifer system;
 - (b) hydrogeology of regional palaeochannel aquifer systems; and
 - (c) cost effective design for confining fine-grained Portia tailings.
39. The disputed core R&D activity at Kalkaroo was described by Havilah as:
- (a) investigation of gold in tertiary clays at Kalkaroo.

ORAL EVIDENCE FROM HAVILAH

Dr Chris Giles

40. Dr Giles provided two written statements and oral evidence. I set out below a summary of the general evidence he gave.
41. Dr Giles is a geologist with a PhD from the University of Adelaide. He is a member of the Geological Society of Australia and the Australian Institute of Geoscientists. He and Bob Johnson jointly found Havilah in 1997.
42. He has been the technical director or managing director since Havilah was listed on the Australian Stock exchange in 2002. Havilah would be considered a junior resource company. At the relevant time it had about eight employees, three of whom had a PhD.
43. Dr Giles provided oversight to all of the research and development work conducted by the professional staff, field crews and consultants of Havilah.
44. At the relevant times, Havilah worked in a remote part of north east South Australia where the bedrock geology and hydrology is generally poorly known due to a lack of any rock outcrop, which in turn means that it has generally been poorly studied by comparison with other geological terrains in Australia.
45. Havilah has still not conducted any mining activity at Kalkaroo and Maldorky despite carrying out the claimed R&D activities many years ago. A mineral resource has been identified but they are both in the early planning stages.

46. The mine at Portia was in production for three years from 2016 to 2019. Havilah has now sold the mining lease in respect to Portia.
47. Dr Giles explained that a junior resource company like Havilah will start with a basic concept of where a mineral deposit might be and will then drill so as to establish an indication of economic mineralisation. A very detailed drilling program is then required before a resource can be established. Once the resource is established, scoping studies are carried out to determine the likely economic viability of the resource. It is at this stage that the R&D activities are carried out and numerous hypotheses are developed.
48. Before a project can get underway Havilah must demonstrate it to be economically viable so that funding can be attracted. In addition, Havilah must satisfy the statutory requirements so as to obtain the necessary permit.
49. Permits are required in order to develop any mining project in South Australia. The process of obtaining these permits can take a long time and it often runs in parallel with the feasibility study. An exploration licence is required in order to carry out any form of exploration. It allows you to drill so as to identify whether there is an economic resource. Once an economic resource is established then the next step is a mining licence.

Travis Just

50. Mr Just is a senior research geologist employed by Havilah. He provided a written witness statement and gave oral evidence with respect to the mining projects at Portia and Kalkaroo.
51. Mr Just was the geologist responsible for the drilling and logging of bores and subsequent sampling and modelling with respect to the managed aquifer recharge system at Portia. He said that the location and nature of the palaeochannel was undefined at the outset and only became apparent from the drilling, logging and particle size analysis work. Mr Just explained further under cross examination that the particle size analysis provided hydrological parameters such as transmissivity and storativity.¹⁴

¹⁴ Transcript p 327 Just XXN

52. With respect to Kalkaroo, Mr Just was responsible for planning the locations and designs of drillholes and supervising the sampling and the geological modelling using Vulcan 3D software. He agreed under cross examination that the purpose of the drilling, sampling and modelling was to find out whether there might be gold mineralisation in the namba clays.¹⁵

Dr Geoffrey Stolz

53. Dr Stolz has now retired, but he worked for Havilah for 11 years as a senior research geologist. He had over 40 years of relevant experience including a PhD in geochemistry. He provided a written statement and gave oral evidence about each of the three projects at Maldorky, Portia and Kalkaroo. He was known as Mr Maldorky because of his particularly extensive involvement as project manager at that site. His evidence, where relevant, is considered below with respect to each alleged claimed activity.

John Lindsay Curtis

54. Mr Curtis was engaged by Havilah to provide expert evidence in relation to this matter. The focus of his report¹⁶ was the Portia project. He considered that the claimed activities at Portia were core R&D activities and said that because they were rejected on what he considered to be weak grounds, the other two projects at Maldorky and Kalkaroo should be reassessed as well. Given that he gave no specific consideration to the issues that were raised with respect to Maldorky and Kalkaroo his opinions should be confined to Portia.
55. With respect to Portia, I give the opinions expressed by Mr Curtis very little weight because it is apparent that he disagreed with aspects of the statutory definition of core R&D activities. In particular:

¹⁵ Transcript p 327 Just XXN

¹⁶ Exhibit 19, Curtis Report

- (a) he considers that R&D need not follow the systematic progression of work contemplated by the Act, but could simply be data acquisition followed by assessment;¹⁷
 - (b) he considers that R&D need not commence with an hypothesis,¹⁸ and that the term hypothesis is not used in practical geoscience because results can never be reliably predicted;¹⁹
 - (c) he considers that 'new knowledge' is information and data that was not present before and could include 'any numerical data generated',²⁰ including site specific measurements.²¹
56. Further, the conclusions stated in the written report²² do not address the legislative requirements of core R&D activities and do not assist me in determining whether those requirements are satisfied. Mr Curtis criticises the findings made on the internal review decision but fails to provide his own opinion with respect to the elements of the definition of core R&D activities.

Richard Aldam

57. Mr Aldam is a hydrogeologist engaged by Havilah to give expert evidence. He provided a written statement dated 26 November 2018²³ and gave oral evidence. He trades as Aldam Geoscience, which provided numerous reports as a consultant to Havilah with respect to its mining activities.
58. With respect to Maldorky, he provided reports in August 2012²⁴ and February 2013²⁵ regarding groundwater assessment and groundwater modelling. He gave evidence, which

¹⁷ Exhibit 19 p vi; Transcript p 400

¹⁸ Exhibit 19 p 7

¹⁹ Exhibit 19, p 5 to 6; Transcript p 404 lines 2 to 25

²⁰ Transcript p 406 lines 4 to 11 and 24 to 30 Curtis XXN

²¹ Transcript p 407 line 39 to p 408 line 7 Curtis XXN

²² Exhibit 19 p 35 to 36

²³ Exhibit 23

²⁴ T documents at T10 p 651

²⁵ T10 p 637

is referred to below, when relevant to each of the claimed activities. His opinions in his written statement of November 2018 were confined to the core activities claimed at Portia relating to hydrogeology of the basement rock aquifer system and the palaeochannel aquifer systems and the core activity claimed at Maldorky relating to understanding hydrology and developing a process for groundwater management.

Core R&D Activities claimed at Maldorky

Background to Maldorky based on evidence from Havilah

59. Dr Giles gave evidence with respect to the Maldorky project. The geological formation at Maldorky is about 800 million years old as opposed to the older Broken Hill aged rocks which are 1.6 billion years old. It is a completely different geological setting than Portia and Kalkaroo.
60. Havilah identified an iron ore deposit of about 145 million tonnes. It was situated adjacent to a River Red Gum ecosystem in an area known as Olary Creek which was environmentally sensitive. The question was how to develop it and what were the constraints to its viability. Research was required. Groundwater was the key issue.
61. The average grade of this iron ore was 24 to 30% which needed to be upgraded to 60 to 65% before it could be exported. This process is known as '*beneficiation*' and it is carried out on site. It requires a large amount of water and produces a large amount of tails material.
62. The first issue was whether there was sufficient water for the beneficiation process. The second issue was whether the mine dewatering would deplete the potable groundwater used by landholders for their stock. The third issue was the impact on the River Red Gum ecosystem from the mine dewatering activities. The fourth and related issue was whether Havilah could build a tailings storage facility without impacting on the potable groundwater used by landholders for their stock and the River Red Gum ecosystem.
63. Most of the activities at Maldorky were carried out or at least overseen by Havilah's senior research geologist, Mr Stolz. Mr Stolz and Rick Aldam of Aldam Geoscience used existing bore holes to conduct pump tests to determine, *inter alia*, the aquifer size at Maldorky.

The results of these tests were presented to a hydrological consulting firm, Australian Groundwater Technologies, for analysis and interpretation. Mr Stolz said that these activities gave Havilah confidence that the open pit mine could be easily dewatered and that it was not likely to deplete or have a negative impact on the nearby potable water aquifer or the freshwater ecosystem of Olary Creek.

64. Mr Stolz also conducted tests with respect to a proposed tailings storage facility. He engaged a tails expert, Alan Burgess of BTM Solutions, to research, design and test possible ways to manage potential tails from the Maldorky iron ore deposit. Mr Stolz prepared a tails sample and then collected local clays from the subsurface of the area. BTM Solutions and an experimental laboratory in Perth, named Golders, conducted certain experiments so that it was concluded that the subsurface material would form an adequate seal for the storage of the tails.

Respondent contentions as to claimed core R&D activities at Maldorky

65. The respondent contends with respect to the claimed core activities in 2012/2013 and 2013/2014 at Maldorky that the specified activities as registered were not carried out. To the extent that the specified activities as registered were carried out, the respondent contends:
- (a) the outcomes of these activities could have been known or determined in advance on the basis of current knowledge, information or experience;
 - (b) the outcomes of these activities were not determined by applying a systematic progression of work that proceeded from hypothesis;
 - (c) the activities were not conducted for the purpose of generating new knowledge; and
 - (d) the activities were associated with complying with environmental statutory requirements or standards.

Understanding hydrology of the Maldorky region and developing a process for ground water management – claimed core R&D activities in 2012/2013 (activity 1.2) and in 2013/2014 (activity 2.2)

66. Havilah hypothesised in its application for registration that:²⁶

...ground water exists in the Maldorky region and that it can be drawn upon for use in the company's processing plant without undue impact on the ground water system including excessive drawdown, impact on adjacent or related aquifers or contamination.

67. I note that there was no written expression of this hypothesis until May 2014 when Havilah made its application for registration of its claimed activities.

68. The experimental activities claimed by Havilah were pump testing to determine groundwater levels, analyses of groundwater, the development of a hydrological model, testing the hydrological model by conducting computer simulations and testing the impact of the process water requirements.

69. Aldam Geoscience was engaged to conduct a groundwater assessment. The report from Aldam Geoscience, dated 21 August 2012,²⁷ provided that the aim of the investigation was to identify baseline hydrogeological conditions for use in the development of a pit dewatering program and to assist in the obtaining of environmental and mining approvals. The investigation used existing data and drillholes. Water samples were collected from the pumped holes during testing and also from Olary Creek. The results indicated that groundwater at Maldorky was very saline. The drillholes were test pumped in July 2011 for the purpose of measuring the depths to water. The test pumping in the two drillholes produced markedly different results. It was recommended that additional test pumping be carried out on selected drillholes. It was also recommended that depth to water measurements be taken from dedicated groundwater investigation wells or drillholes further to the north, east and south.

70. I note that the testing activities referred to in the 21 August 2012 report were carried out prior to 1 July 2012 and are therefore activities that fall outside the relevant period. Dr

²⁶ T4 p 77

²⁷ T10 p 651

Stolz agreed during oral evidence that any pumping tests took place in the period prior to the first registration year.²⁸ The Havilah response to request for information dated April 2015 confirmed that the majority of groundwater and hydrogeological sampling experimental activities took place in the 2011/12 year.²⁹

71. Aldam Geoscience prepared a second report dated 8 February 2013³⁰ for the stated purpose of constructing and running a numerical groundwater model to assess possible pit dewatering rates for the mining of iron ore at Maldorky. A digital groundwater model was constructed using groundwater modelling software. The 2011 test results were analysed. The model indicated that groundwater extraction would be required at certain rates so as to maintain dry pit floor conditions in the mine.
72. There was no hypothesis expressed in the Aldam Geoscience reports nor any record of a systematic progression of work that proceeded from hypothesis to experiment, observation and evaluation, and leads to logical conclusions. Those reports merely recorded the results of the investigation as to the hydrogeological conditions at Maldorky.
73. Mr Stolz gave evidence that the data generated by the testing showed two separate aquifers. The first aquifer was in the bedrock and contained a very large volume of saline groundwater which could be accessed for mining operations. The second was a perched aquifer near the surface containing a limited volume of potable water that supplied the River Red Gums at Olary Creek and the bores used by local station owners. These aquifers are not connected, which means that usage of saline groundwater in a mining operation is not likely to deplete the perched shallow potable water aquifer and therefore should have minimal impact on the ecosystem in Olary Creek and on the stock water supplies for local users.
74. Mr Middlemis, opined that these activities were routine hydrogeological investigations, rather than experimental testing of a hypothesis. I agree. The pump testing and development of the groundwater flow model involved standard methods for obtaining site specific data to investigate routine questions. Mr Aldam accepted in cross-examination

²⁸ Transcript p 367 Stolz XXN

²⁹ T10 p 460

³⁰ T10 p 637

that the application of the groundwater model to the unique characteristics of the Maldorky deposit was a process which used well established hydrogeological techniques for groundwater modelling.³¹ It was not an innovative process.

75. Further, the knowledge generated by the testing and modelling related to the specific hydrogeology of the Maldorky area and the requirements and likely effects of open pit dewatering. This is confirmed by Mr Aldam, in his written statement, who said that the research gap was a lack of information on the Maldorky site's hydrogeology and potential impacts of the drawing of groundwater for ore processing. Mr Aldam went on to say that the results of the depth to water measuring, water sample analysis and test pumping analysis were 'site specific' knowledge.

76. Havilah relies upon the conclusion of Mr Aldam that:

*The outcomes of the work could not have been known in advance because virtually no groundwater work had been carried out in the deposit area and new knowledge was generated by data collection and analysis as well as from the simulation of dewatering.*³²

77. It is not enough that the outcomes could not have been known in advance. In order to satisfy the definition of core R&D activities there must be experimental activities of the nature set out in the two subsections of s 355-25(1). I do not consider that the 'new knowledge' referred to by Mr Aldam satisfies the definition of core R&D activities. Information derived from a routine investigation of hydrogeological conditions is not an outcome that can only be determined by applying a systematic progression of work that proceeds from hypothesis and leads to logical conclusions. In this case, the outcome was determined by a process of routine investigation. There was no hypothesis postulated at the time of the engagement of Aldam Geoscience and they were not involved with the testing of an hypothesis by experimentation.

78. I find that these activities claimed by Havilah do not satisfy the elements of the definition of core R&D activities in s 355-25(1).

³¹ Transcript p 526 line 6 Aldam XXN

³² Exhibit 23 p 8

Were activities associated with complying with statutory requirements?

79. The respondent contends that the activities involved in understanding the hydrogeology of Maldorky were activities associated with complying with statutory requirements or standards and therefore come within the exclusion in s 355-25(2)(f). Support for this contention comes from the report of Aldam Geoscience dated 21 August 2012, which provides for a dual purpose with respect to these claimed activities as follows:

The aim of the investigation is to identify baseline hydrogeological conditions for use in the development of a pit dewatering program and to assist in the obtaining of environmental and mining approvals.³³

80. The later report from Aldam Geoscience dated 8 February 2013³⁴ refers to the construction of a numerical groundwater model and Havilah's intention to apply for a mining lease to enable mining to occur.

81. Mr Aldam was involved in the development of a draft of a mining lease proposal for Maldorky. He expected that his report dated 8 February 2013 would form an appendix to the approvals documentation.³⁵

82. The claimed activities of testing and analysis of groundwater and the development of a hydrological model are the subject of the statutory requirements and standards contained in the Ministerial Determination 005 gazetted on 12 July 2012 at paragraphs 2.9 (hydrology), 2.10 (groundwater) and 3.5.5 (mine dewatering). It is work that had to be done as part of the approvals process.³⁶ Havilah's annual company report for the year ended 30 June 2013 confirmed the 'focus' on progressing approval documentation for the mining lease proposal at Maldorky in that year.³⁷ I find that the claimed activities (1.2 and 2.2) are not core R&D activities because they are associated with complying with statutory requirements or standards.

³³ T10 p 651

³⁴ T10 p 637

³⁵ Transcript p 508 to 509 Aldam XXN

³⁶ Exhibit 26, Middlemis Report at 2.1(k) p 18

³⁷ Transcript p 231 to 232 Giles XXN

Securing fine-grained Maldorky tailings – claimed core activities in 2012/2013 (activity 1.3) and in 2013/2014 (activity 2.3)

83. Havilah has stated its hypothesis in its application for registration as follows:

Havilah hypothesized that an impermeable seal could be generated by using the tailings, to result in a suitable TSF and related processes which could successfully eliminate seepage and contamination. Specifically, the proposed tails are in the form of clay-like minerals (in the form of slime), and non-acid forming with trace indications of heavy metal.³⁸

84. Havilah claimed its experiment involved mineralogical geotechnical investigations (testing the prepared samples) and geotechnical modelling (evaluating the footprint and depth of the tails storage facility). It described this experimentation as involving both physical testing and numerical modelling in an iterative process to develop a design for a tailings storage facility.

85. Mr Stolz gave evidence that Havilah wanted to come up with an innovative way to be able to store the tails that were a voluminous by-product of the mining operation. In particular, Havilah wanted to avoid the expense of a conventional design which used impermeable plastic membrane.

86. Mr Stolz generated a tails sample which was then the subject of experiments involving local surface materials. Havilah engaged Alan Burgess, from BTM Solutions, who was a leading tails expert. His brief was to research, design and test possible ways to manage potential tails from the Maldorky iron deposit. If the tests were positive, and if the project was economically viable, then a tailings storage facility would be designed.

87. BTM Solutions prepared a report dated May 2014.³⁹ The executive summary provides that the report describes the conceptual design of the tailings storage facility in support of a mining lease proposal for the project. The report said:

Site visits were carried out in 2013 as part of this study to collect samples and to log the geotechnical profiles of trenches and holes excavated within the TSF footprint. A representative tailings sample, from the beneficiation of an 800 kg ore composite, was used for geotechnical and geochemical tests to provide design

³⁸ T13 p 802

³⁹ Exhibit 3, tab 7

*parameters. Geotechnical testing was also carried out on possible construction materials identified during the field investigations.*⁴⁰

88. Various options for the design were considered and then compared. The chosen design was:

*...a ring dyke type embankment, utilising competent and durable materials from the TSF footprint and the waste from the open pit to construct the perimeter walls and the remainder will be used for the final closure capping.*⁴¹

89. Mr Stolz gave evidence that prior to this work there was no knowledge that could be applied to tails product from this project and hence how it could be accommodated in a tailings storage facility. He said that the situation arose because no tailings storage facility had been constructed using local sands, silts and clays on the local subsurface foundation materials. He said that the work resulted in new knowledge that indicated that both the tails themselves and the local surface and subsurface material would form a seal to a tailings storage facility and so minimise seepage and loss of process water.

90. I agree with the opinion expressed by Mr Middlemis⁴² that the tailings sampling and testing and the geotechnical modelling were routine investigations that applied standard methods, rather than the experimental testing of a hypothesis. He said that the tailings sampling and testing involved applying standard laboratory tests to measure the physical characteristics (particle size, specific gravity (density) and permeability) of the waste material. The results of these tests were used as input to the geotechnical modelling to investigate and optimise the tailings storage facility design and tailings emplacement methods to achieve a cost-effective, water minimising and geotechnically stable tailings storage facility.

91. Mr Middlemis said that new knowledge was produced in terms of a solution to the technical uncertainties applying to the tailings storage facility conditions at Maldorky.⁴³ The new knowledge related to the specific characteristics of the Maldorky site and could only be appropriate for another project facing similar conditions. This new knowledge was

⁴⁰ Exhibit 3, tab 7 p7

⁴¹ Exhibit 3, tab 7 p 1

⁴² Exhibit 26, Middlemis Report p 23

⁴³ Exhibit 26, Middlemis Report at 2.5(j) p 26

not the outcome of experimental activities but was rather derived from routine investigations of how site specific waste material could be stored in a facility made using local materials without excessive seepage or loss of process water.

92. I find that these activities claimed by Havilah do not satisfy the elements of the definition of core R&D activities in s 355-25(1).

Were activities associated with complying with statutory requirements?

93. The respondent contends that the activities involved in securing fine-grained Maldorky tailings were activities associated with complying with statutory requirements or standards and therefore come within the exclusion in s 355-25(2)(f).

94. The claimed activities of securing fine-grained Maldorky tailings are the subject of the statutory requirements and standards contained in the Ministerial Determination 005 gazetted on 12 July 2012 at paragraph 3.9, which requires a description of the size and location of the tailings storage facility, the appropriate water balance modelling for the tailings storage facility, the conceptual design, construction and operating specifications of the tailings storage facility including the slope stability and seepage assessment. It is work that had to be done as part of the approvals process.⁴⁴ The BTM Solutions report dated May 2014⁴⁵ was provided for the purpose of supporting the mining lease proposal for Maldorky. This is evident from its title 'Maldorky Iron Project. Design Studies to support a mining lease proposal – Tailings Storage Facility'. I find that the claimed activities (1.3 and 2.3) are not core R&D activities because they are associated with complying with statutory requirements or standards.

Core R&D Activities claimed at Portia

Background to Portia based on evidence from Havilah

95. Portia is a gold resource of about 67,000 ounces situated about 70 metres into the bedrock. Havilah proposed developing an open pit mine, a processing plant and a tailings

⁴⁴ Exhibit 26, Middlemis Report at 2.5(k) p 26

⁴⁵ Exhibit 3, tab 7 p i

storage facility. For the mine to be feasible, the water generated from the development of the open pit mine had to be sufficient for the processing plant where the gold is extracted. If the amount of water generated was surplus to the needs of the processing plant then that surplus must be dealt with. Havilah came up with the idea of a managed aquifer recharge system by which the surplus water would be put back into the ground by injecting it into a palaeochannel. A further water related issue is what to do with the waste water generated from the processing plant. Havilah proposed the development of a tailings storage facility. As Mr Giles said 'it is all about the water balance.'⁴⁶

96. Dr Giles gave evidence that there were three elements to the R&D activities at Portia. The first element was to determine how much water would be generated when digging the open pit gold mine. The second element was finding a suitable receptor for the excess water. The third element was the development of a tailings storage facility for the waste water with minimal leakage and seepage.
97. Havilah gathered experimental data to determine the volume of groundwater that would be generated from the open pit mine and the volume of the excess that would need to be reinjected. 21 bore holes were drilled to look for a palaeochannel that would receive the excess water as part of a managed aquifer recharge system. Tests were done to see how much water could be injected. Drilling was also carried out in the tailings dam location so as to try and understand the subsurface of the dam. Tests were also carried out with respect to the compaction of the local clay content to determine whether it would form a stable and suitable tailings dam wall.
98. As a result of this activity Havilah determined that it could have an overall and integrated managed aquifer recharge system that would take care of the amount of water expected from the open pit gold mine. It was determined that water, surplus to the needs of the processing plant, could reasonably be expected to be injected into the aquifer so as to recharge it. It was also determined that a tailings storage facility for the waste water could be constructed using purely local materials.

⁴⁶ Transcript p 80 line 45 Giles XN

99. Dr Giles said that this activity generated new knowledge which was scientifically gathered as a result of following a hypothesis. The information generated can be used by a contractor to develop the mine. The new knowledge was that in developing a mine in this area there is a reasonable expectation of enough water to sustain the processing operation. The new knowledge with respect to excess water was that the palaeochannel was able to take a significant volume of water, namely all of the excess water generated from the mine. The new knowledge for the tailings dam was that the materials available locally are quite suitable for building tailings walls.

Respondent contentions as to claimed core R&D activities at Portia

100. The respondent contends with respect to the claimed core activities in 2012/2013 and 2013/2014 at Portia that the specified activities as registered were not core R&D activities because:
- (a) the outcomes of these activities could have been known or determined in advance on the basis of current knowledge, information or experience;
 - (b) the outcomes of these activities were not determined by applying a systematic progression of work that proceeded from hypothesis;
 - (c) the activities were not conducted for the purpose of generating new knowledge;
 - (d) the activities were associated with complying with environmental statutory requirements or standards; and
 - (e) in the case of activities 2.2, 3.1 and 3.3 there is insufficient documentation to support the claimed carrying on of experimental activities.

Hydrogeology of the Portia area basement rock aquifer system (core) (2012/13 at 2.1 and 2013/14 at 3.1)

101. The hypothesis put forward by Havilah in its application for registration was that there was sufficient ground water for the mine and processing plant that could be drawn upon without undue impact on the local environment and that the planned open pit mine could be adequately dewatered (drained).

102. I note that this hypothesis is expressed in terms particular to the Portia mine site and the activities proposed for that site. The hypothesis is expressed as a statement of a proposed resolution of a routine problem at the particular site.

103. Havilah engaged Australian Groundwater Technologies (AGT), who prepared a report in April 2013 entitled 'Portia Dewatering Assessment'.⁴⁷ The executive summary provided:

A numerical groundwater model was constructed for Havilah Resources to investigate the most appropriate dewatering bore-field layout to achieve successful operation of the Portia gold deposit mine. The numerical groundwater flow model was successfully calibrated to pumping test data from two separate tests carried out at the Portia site and was subsequently employed to investigate a range bore-field configurations to achieve successful mine pit dewatering.

The final mine pit dewatering scenario selected by Havilah Resources involved 12 dewatering bores in two stages (nine initial bores followed by three after 180 days) and pit-floor sumping advice from 300 days. Simulated pumping operations lasted 840 days, with the entire simulation time being 110 years to investigate the recovery of the groundwater system.

Dewatering scenario modelling results indicated that the modelled dewatering bore and pit floor sump configuration would keep groundwater levels below that of the pit elevation throughout the life of the mine.

...

Two palaeochannels (Shylock and Yarramba) are located near the Portia mine site and were explicitly considered during numerical modelling.

104. The pumping test data was provided to Mr Armstrong who then completed the modelling for Havilah. Attached to the AGT report was appendix A entitled 'Groundwater Modelling for Portia Gold Deposit Dewatering'. The numerical groundwater model was constructed to investigate the most appropriate dewatering bore-field layout to achieve successful operation of the Portia gold deposit.

105. Mr Middlemis considered the claimed core activity 2.1 for Portia and said:

The tests did not comprise hypothesis testing. Rather, they comprised a standard and routine groundwater model development activity to investigate options for dewatering (drainage) of a proposed open pit that will extend below the water table. The objective of the investigation was to identify whether the planned Portia open pit can be dewatered to maintain dry working conditions on the pit floor (required for safety and reduced operational mining costs) via a cost-effective system of pumping wells around the periphery of the planned Portia open pit and

⁴⁷ Exhibit 3, tab 9

*pumping from sumps in the pit floor, with a pipeline system to convey the discharge volumes. This is a common modelling task that is discussed many times in the 2012 best practice groundwater modelling guidelines in terms of the various methods that could be applied ...*⁴⁸

106. Mr Aldam said that the information gap was information on the site's hydrology and the amount of water to be withdrawn to enable mining to occur. He said that the experimental activities included the development of a numerical groundwater flow model to simulate various dewatering configurations. The result was the identification of a preferred dewatering configuration. He said new knowledge was generated by data collection and analysis and from the simulation of dewatering.⁴⁹
107. I accept the opinion expressed by Mr Middlemis. The development of a ground water model based upon data from pumping tests on bores at Portia was not an experimental activity but was rather an exercise in characterising the hydrogeological features of the Portia site. Dr Giles accepted that the pumping tests generated information specific to the particular proposed mining location.⁵⁰ These claimed activities provided Havilah, in the words of Dr Giles, with 'an understanding of the likely groundwater regime ... which could then possibly inform a de-watering regime.'⁵¹ The AGT report⁵² refers to 'A suite of published solutions' which 'have been used to analyse the pumping test data from the test bores.' Mr Aldam gave evidence that these 'published solutions' are established methods of analysing aquifer characteristics⁵³ and that those established methods were applied to a unique set of data derived from the drilling and testing of the wells.⁵⁴ Mr Aldam agreed that 'the tools used in analysis are common, as is the means of acquiring the data; the data are unique at each location'⁵⁵ and 'the principles used are common, and have been used for – for some time to produce unique outcomes, or unique results, given the geology and hydrogeology at a location.'⁵⁶

⁴⁸ Exhibit 26, Middlemis Report at 4.1(b)

⁴⁹ Exhibit 23 p 4

⁵⁰ Transcript p 259 lines 42 to 46 Giles XXN

⁵¹ Transcript p 260 lines 13 to 16 Giles XXN

⁵² Exhibit 3, tab 9 at 3.2

⁵³ Transcript p 548 line 45 Aldam XXN

⁵⁴ Transcript p 549 lines 1 to 4 Aldam XXN

⁵⁵ Transcript p 556 lines 6 to 7 Aldam XXN

⁵⁶ Transcript p 556 lines 17 to 20 Aldam XXN

108. There is no technical report for the activities claimed at Portia in 2013/14, but there is some evidence that Havilah installed pumps in nine bores and conducted testing so as to refine the groundwater model. These activities are of a similar nature to the previous year and are not core R&D activities for the same reason as above.
109. I do not consider that the new knowledge asserted by Dr Giles and Mr Aldam is sufficient to satisfy the definition of core R&D activities. Information derived from a routine investigation of hydrogeological conditions at a specific site is not an outcome that can only be determined by applying a systematic progression of work that proceeds from hypothesis and leads to logical conclusions. In this case, the outcome was determined by a process of routine investigation. There was no hypothesis postulated at the time of the engagement of AGT and no mention in the AGT report dated April 2013. The claimed activities did not involve the testing of a hypothesis by experimentation.
110. I find that these activities claimed by Havilah do not satisfy the elements of the definition of core R&D activities in s 355-25(1).

Were activities associated with complying with statutory requirements?

111. The respondent contends that the activities involved in the hydrogeology of the Portia area basement rock aquifer system were activities associated with complying with statutory requirements or standards and therefore come within the exclusion in s 355-25(2)(f).
112. The claimed activities of carrying out and interpreting hydrogeological test results, developing a groundwater flow model and investigating dewatering options for the open pit are the subject of the statutory requirements and standards contained in the Ministerial Determination 005 gazetted on 12 July 2012 at paragraphs 2.9 (hydrology), 2.10 (groundwater) and 3.5.5 (mine dewatering). It is work that had to be done as part of the approvals process.⁵⁷ The work documented in the April 2013 AGT report was part of a parallel process of permitting and commercialisation.⁵⁸ Havilah's 2014 annual report described the focus for the year as the 'preparation of the PEPR, including gathering all

⁵⁷ Exhibit 26, Middlemis Report at 4.1(k) p 45

⁵⁸ Transcript p 257 line 32 Giles XXN

supporting detailed technical data' and provided that a 'major focus of the finalisation of the PEPR was site dewatering pumping and water re-injection trials.'⁵⁹ I find that the claimed activities (2.1 and 3.1) are not core R&D activities because they are associated with complying with statutory requirements or standards.

Hydrogeology of regional palaeochannel aquifer systems (core) (2012/13 at 2.2 and 2013/14 at 3.2)

113. Havilah expressed an hypothesis in its applications for registration that the Shylock Palaeochannel is sufficiently wide and deep to accept all excess water from the Portia open pit dewatering activities utilising a managed aquifer recharge scheme, and that it is sufficiently separated from the Portia mine aquifers so that no significant inflow back to the mine will occur.
114. I note that this hypothesis is expressed in terms particular to the Portia mine site and the activities proposed for that site.
115. Dr Giles gave evidence that managed aquifer recharge schemes are used commonly to deal with excess stormwater in cities but that the concept was "quite novel ... in a mining sense."⁶⁰ He was aware of only one other mine in Australia to use the concept. It was general knowledge that there were palaeochannels in the area of the Portia mine but it was not known if they were of suitable porosity and permeability to be able to take any excess water generated from the Portia open pit mine. The experimental activities included drilling 21 bores in April to May 2013⁶¹ so as to locate the palaeochannel and test its characteristics by scenario modelling.⁶² As a result of these activities Havilah determined that an integrated managed aquifer recharge system would take care of the amount of water expected from the Portia open pit.⁶³

⁵⁹ Exhibit 2, Annual Report 2014 p7

⁶⁰ Transcript p 81 Giles XN

⁶¹ See T4 p 85 and exhibit 10 at 3.1

⁶² See T13 p 808 and 809

⁶³ Transcript p 86 lines 18 to 20 Giles XN

116. In October 2013 AGT prepared a report entitled 'Portia Gold MAR Investigations'.⁶⁴ AGT was engaged by Havilah to undertake a hydrogeological investigation to evaluate the potential for a managed aquifer recharge scheme as part of the Portia gold project. The overall aim of the investigation involved the development of a numerical groundwater model which was used to design the managed aquifer recharge injection well field. The overall scope of the investigation included the drilling and testing of wells to evaluate the aquifer regional properties and the effects of injection; the sampling of groundwater chemistry of the source water; and the updating of the existing numerical groundwater model to better characterise the palaeochannel. The report concluded that the groundwater investigation had identified the potential for developing a managed aquifer recharge scheme targeting the Shylock Palaeochannel to support the Portia gold project, and it was recommended to install managed aquifer recharge wells with the view to monitor the effectiveness of injection over the first few months of operation.
117. Mr Aldam said that the information gap was hydrogeological information specific to the Shylock Palaeochannel and its potential as a receptor for excess mine water. He said that the experimental activities included the development of a numerical groundwater model to enable the injection into the Shylock Palaeochannel to be simulated. The result was that the palaeochannel could be used to dispose of excess pit water with no significant inflow back to the mine. He said new knowledge was generated by data collection and analysis and from the simulation of dewatering.⁶⁵
118. Mr Middlemis considered the claimed core activities 2.2 and 3.2 for Portia and said:

The tests did not comprise hypothesis testing. Rather, they comprised standard and routine hydrogeological drilling, sampling and pumping tests and subsequent routine groundwater modelling tasks to investigate options for the dewatering (drainage) of a proposed open pit that will extend below the water table, and the disposal of excess water to the Shylock Palaeochannel.

The objective of the investigation was to identify whether the planned Portia open pit dewatering can be achieved with acceptable environmental impacts, and whether the volumes produced can be conveyed to the Shylock Palaeochannel and then injected to that aquifer via a managed aquifer recharge scheme ...

Related routine investigations (again, not hypothesis testing) were required into whether the Shylock Palaeochannel is of sufficient width, depth, permeability and

⁶⁴ Exhibit 3 tab 10

⁶⁵ Exhibit 23 p 5 and 6

*storage to accept the discharge volumes without unwanted effects (eg via inducing high groundwater levels), that the water quality is compatible and that operational MAR scheme issues can be dealt with by design and management actions.*⁶⁶

119. I accept the opinion expressed by Mr Middlemis. The claimed activities involved standard and routine sampling and testing so as to develop a groundwater model for the purpose of identifying the hydrogeological characteristics of the Portia site. Dr Giles accepted in cross examination that the program of drilling and sampling in the claimed core activities revealed the permeability and storability characteristics of the Shylock Palaeochannel.⁶⁷ The program also provided measurements with respect to the level, salinity and transmissivity of groundwater. The generated data was then inserted into a model so as to evaluate a range of managed aquifer recharge options. The AGT report concluded that the most viable option involved the injection of 1679 mega litres into eight wells over a period of 1030 days. The results generated from the program of drilling and sampling followed by the modelling were evaluated in terms of the hydrogeological and water engineering requirements for a successful mining operation at Portia. In the words of Dr Giles, it was discovered 'that we could have an overall and integrated managed aquifer recharge system that would take care of the amount of water we'd expect to get out of the Portia pit.'⁶⁸
120. These claimed core activities investigated and provided details of the characteristics of the Shylock Palaeochannel for purposes specific to the proposed Portia mine. There was no systematic progression of work that proceeded from hypothesis to experiment, observation and evaluation, leading to logical conclusions as required by s 322-25(1)(a)(ii).
121. Further, there is no written evidence of the existence of the hypothesis at any time in the year ending 30 June 2013, nor is a hypothesis expressed in the AGT reports dated April and October 2013. It is apparent from those reports that AGT was engaged to undertake hydrogeological investigations related to the Portia gold project. The scope and purpose of the investigation are clearly articulated. There is no mention of an hypothesis to be tested by way of experiment, observation and evaluation.

⁶⁶ Exhibit 26, Middlemis Report at 4.4(b)

⁶⁷ Transcript p 268 lines 8 to 16 Giles XXN

⁶⁸ Transcript p 86 lines 18 to 20 Giles XN

122. I find that these activities claimed by Havilah do not satisfy the elements of the definition of core R&D activities in s 355-25(1).

Were activities associated with complying with statutory requirements?

123. The respondent contends that the activities involved in the hydrogeology of the regional palaeochannel aquifer system were activities associated with complying with statutory requirements or standards and therefore come within the exclusion in s 355-25(2)(f).

124. The claimed activities of carrying out and interpreting hydrogeological test results to investigate the characteristics of the palaeochannel and the impact of a managed aquifer recharge system are the subject of the statutory requirements and standards contained in the Ministerial Determination 005 gazetted on 12 July 2012 at paragraphs 2.9 (hydrology), 2.10 (groundwater) and 3.5.5 (mine dewatering). It is work that had to be done as part of the approvals process for a mining lease proposal.⁶⁹ The outcomes of these claimed activities eventually formed part of the mineral lease proposal that was submitted in 2014. I find that the claimed activities (2.2 and 3.2) are not core R&D activities because they are associated with complying with statutory requirements or standards.

Cost effective design for confining fine-grained Portia tailings (core) (2012/13 at 2.3 and 2013/14 at 3.3)

125. With respect to the core activity 2.3 in the 2012/13 year Havilah hypothesised in its application for registration that:

A suitable innovative tailings storage facility (TSF) and processes can be designed which successfully prevents seepage using clever design and management and use of indigenous materials.⁷⁰

126. With respect to the core activity 3.3 in the 2013/14 year Havilah hypothesised in its application for registration that:

⁶⁹ Exhibit 26, Middlemis Report at 4.4(k) p 54 which refers to paragraph 4.10 of the Mining Regulatory Guidelines MG2. See also 2014 Annual Report references to the PEPR at p 7

⁷⁰ T4 p 85

1. There existed near perfect lining material in the fine slimy tailings themselves and the likely available clayey subsurface material, resulting in levels of seepage within acceptable limits, if appropriately compacted

2. The dewatering water is identical to the regional groundwater (as it is from the same source) and therefore a small amount of seepage would not have an adverse environmental effect (because no chemicals of any sort of being added, since the proposal is to use a gravity separation process)

3. A two-cell, alternate-drying TSF design would allow the tailings to dry out in a time frame short enough to permit rehabilitation upon mine closure.⁷¹

127. I note that this hypothesis is expressed in terms particular to the Portia mine site. The hypothesis is expressed as a statement of a proposed resolution of a routine problem at the particular site.

128. Dr Giles gave evidence that no one had built a tailings storage facility in the vicinity and that it was therefore unknown whether an adequate facility with limited seepage could be built using local materials.⁷²

129. The activities included the collection of data from the field and geotechnical and seepage test work and modelling. Havilah then engaged Golder Associates, who did the technical analysis and the final design drawings. Golder Associates prepared a report dated 3 June 2013⁷³ which provided as background:

Havilah is in the process of obtaining the necessary approvals to develop the Portia Gold Mine As part of this approvals process, Havilah Resources has engaged Golder to undertake design studies for a tailings storage facility (TSF) required as part of the project.

130. Mr Middlemis considered the claimed core activities 2.3 and 3.3 for Portia and said:

The tests comprised drilling and test-pitting, soil and water sampling and laboratory analysis, and subsequent geotechnical modelling.

The tests did not comprise hypothesis testing. Rather, they comprised standard and routine hydrogeological and geotechnical investigations into the feasibility and optimisation of a TSF for a proposed mining development.

The objective of the investigation was to identify whether a stable TSF can be designed using local (earthworks) materials (rather than an expensive plastic liner) that will result in an effective seal to the base of the TSF that will limit leakage from

⁷¹ T13 p 809

⁷² Transcript p 82 lines 33 to 35 Giles XN

⁷³ Exhibit 3 tab 11

*it. This includes analysis of other TSF system issues, such as the cost-effectiveness of the TSF system, the siting of the TSF in the local environment, its 3D shape, the character, delivery and deposition of the tailings slurry materials and the resulting increasing thickness of tailings with time, and the need for rapid drying of the tailings sediments for rehabilitation to improve the long term stability of the TSF post mine closure.*⁷⁴

131. I find that these core activities were not experimental activities as referred to in s 355-25(1). The report from Golder Associates indicates standard sampling and testing methods and did not identify any innovative new testing methods.⁷⁵ The activities did not involve hypothesis testing, but rather 'comprised standard and routine hydrogeological and geotechnical investigations into the feasibility and optimisation of a TSF for a proposed mining development',⁷⁶ using 'standard geotechnical seepage modelling software'.⁷⁷ The activities were directed to the investigation of variables, the 'causal relationships' between which were 'already well known at the time'.⁷⁸
132. Knowledge was generated about the specific hydrogeological characteristics of the Portia site⁷⁹ but this knowledge was not generated from experimental activities and was not likely to benefit the wider Australian economy because it was site specific.
133. I find that these activities claimed by Havilah do not satisfy the elements of the definition of core R&D activities in s 355-25(1).

Were activities associated with complying with statutory requirements?

134. The respondent contends that the activities involved in the cost effective design for confining fine-grained Portia tailings were activities associated with complying with statutory requirements or standards and therefore come within the exclusion in s 355-25(2)(f).

⁷⁴ Exhibit 26, Middlemis Report at 4.8(b)

⁷⁵ Exhibit 26 Middlemis Report at 4.8(d)

⁷⁶ Exhibit 26 Middlemis Report at 4.8(b) and 4.14(b)

⁷⁷ Exhibit 26 Middlemis Report at 4.8(d) and 4.14(d)

⁷⁸ Exhibit 26 Middlemis Report at 4.8(e) and 4.14(e)

⁷⁹ Exhibit 26 Middlemis Report at 4.8(j) and 4.14(j)

135. The claimed activities of designing a suitable tailings storage facility are the subject of the statutory requirements and standards contained in the Ministerial Determination 005 gazetted on 12 July 2012 at paragraph 3.9, which requires a description of the size and location of the tailings storage facility, the appropriate water balance modelling for the tailings storage facility, the conceptual design, construction and operating specifications of the tailings storage facility including the slope stability and seepage assessment. It is work that had to be done as part of the approvals process because a stable tailings storage facility is a requirement for a mining lease proposal, as outlined in the Mining Regulatory Guidelines MG2.⁸⁰ As set out in the introduction to the Golder report of June 2013, Golder was engaged to undertake design studies for a tailings storage facility as part of the approvals process. The Golder report expressly sets out the legislation and guidelines that were considered when carrying out their work. The tailings storage facility was designed so that it complied with those regulations.⁸¹ I find that the claimed activities (2.3 and 3.3) are not core R&D activities because they are associated with complying with statutory requirements or standards.

Core R&D Activities claimed at Kalkaroo

Background to Kalkaroo based on evidence from Havilah

136. The Kalkaroo deposit is located in Broken Hill aged rocks, which are about 1.6 billion years old and covered by 50 to 70 metres of barren clay overburden.
137. Havilah carried out a great deal of exploration at Kalkaroo and discovered a large copper gold deposit in the ancient bedrock prior to any consideration of the relevant hypothesis. It is a large gold deposit made up of approximately 3 million ounces, but it is situated below the bedrock at least 70 metres under the surface. When drilling through the clay overburden, Havilah identified that there was some gold in the clay overburden. This was unexpected. Dr Giles gave evidence that Havilah hypothesised that some of the gold in the primary deposit below the bedrock may have migrated upward in saline groundwater solutions so as to produce a deposit in the clay overburden. If the hypothesis proved true

⁸⁰ Exhibit 26, Middlemis Report at 4.8(k) and 4.14(k)

⁸¹ Transcript p 279 Giles XXN

then it would be a great exploration tool because if gold in the clay indicated a primary deposit below the bedrock then it could save drilling down into the subsurface to find the primary deposit.

138. The hypothesis was tested by drilling holes into the clay so as to determine the distribution of gold in the tertiary clays. Dr Giles said that the hypothesis was proved true because sub economic levels of gold in the clay were found. It showed that gold could migrate upwards tens of metres from a bedrock gold deposit into the overlying clay. This meant that one should always sample the clay in the routine drilling, and any elevated gold in them could be an indicator of underlying primary bedrock mineralization.
139. Dr Giles said that the new knowledge acquired was that gold could occur in very impervious tertiary clay above a major primary gold deposit. This new technique would be of help to many explorers in the area looking for organic layers and sampling for gold without having to drill deeply into the bedrock.

Respondent contentions as to claimed core R&D activities at Kalkaroo

140. The respondent contends with respect to the claimed core activities in 2012/2013 and 2013/2014 at Kalkaroo that the specified activities as registered were not core R&D activities because:
 - (a) the activities were undertaken for the purpose of identifying the location and quality of gold deposits in the Kalkaroo area for which Havilah held an exploration lease and are therefore excluded under s 355-25(2)(b);
 - (b) the outcomes of these activities were not determined by applying a systematic progression of work that proceeded from hypothesis;
 - (c) the activities were not conducted for the purpose of generating new knowledge; and
 - (d) in the case of activity 1.1, there is insufficient documentation to support the claimed carrying on of experimental activities.

Investigation of gold in tertiary clays at Kalkaroo (core) (2012/13 at 3.1 and 2013/14 at 1.1)

141. With respect to the core activity 3.1 in the 2012/13 year and 1.1 in 2013/14 Havilah hypothesised in its application for registration that:

The gold mineralisation observed above the Kalkaroo bedrock ore body is a secondary mineralisation derived from the primary gold mineralisation in deeper layers, formed either by physical means (eg river washed alluvials, surface lag scree) or chemical means (precipitation from saline groundwaters).⁸²

Do the activities come within the exclusion of prospecting, exploring or drilling for minerals in s 355-25(2)(b)?

142. An activity will not be a core R&D activity if it involves prospecting, exploring or drilling for minerals for the purposes of discovering deposits or determining more precisely the location of deposits or determining the size or quality of deposits.⁸³
143. In its application to register R&D activity for 2012/13, Havilah referred to experimental activities carried out at Kalkaroo 'in order to understand the distribution of gold and other elements in the subsurface.'⁸⁴ Mr Just, the senior research geologist employed by Havilah, put it simply in cross examination when he said that 'the idea of the drilling was to test that theory that there was or might be gold in the namba clay.'⁸⁵ In the quarterly activities report for the period ending July 2013, Havilah said that 'The rationale was that access to shallow Tertiary gold mineralisation at an early stage of mining could potentially lower the start-up project risk in bringing forward project revenue and therefore contributing materially to recovering the cost of overburden removal.'⁸⁶
144. Havilah accepts that the purported experimental activity involved an analysis of the assay results derived from samples collected from the tertiary clay layer so as to determine the

⁸² T4 p 91

⁸³ Section 355-25(2)(b)

⁸⁴ T4 p 91 and T10 p 254

⁸⁵ Transcript p 329 line 5 Just XXN

⁸⁶ Exhibit 2, tab 11 p 4

distribution of gold in the tertiary clays and the recoverability of gold in those clays.⁸⁷ However, it says:

It is important to note that the subsequent investigation of gold mineralisation in Tertiary clay was not conducted for the purposes of discovery of deposits, determining the precise location, size or quality of the deposit. As depicted in the 3D model below, the gold mineralisation in Tertiary clay is not the main ore body, but only a small, secondary mineralisation that could potentially be of economic value if an appropriate processing method that was developed for the primary mineralisation could be modified to accommodate for the Tertiary clay.⁸⁸

145. Havilah asserts that these activities in assaying the tertiary clays were for the purpose of developing a cheap tool to find deeper, richer gold deposits because the presence of gold in the tertiary clays would indicate that a richer gold deposit is likely to be found at depth in hard basement rocks.⁸⁹
146. Mr Middlemis considered that this activity was undertaken for the purpose of determining the location or quality of gold deposits.⁹⁰ He said:

The Kalkaroo tests were undertaken to identify gold mineralisation distribution and investigate mining and mineral recovery processes and tailings waste management processes.

147. The purposes referred to in s 355-25(2)(b) are discovering deposits; determining more precisely the location of deposits; and determining the size or quality of deposits. The prospecting, exploring or drilling for minerals must be for at least one of these purposes. If the prospecting, exploring or drilling is not done for one of these purposes then the exclusion is not satisfied. Each of the purposes relates to 'deposits'. The purpose must relate to discovering deposits or discovering more about the location, size or quality of deposits. If the purpose of the drilling is unrelated to deposits then the exclusion is not satisfied. Havilah has asserted that its purpose in drilling the tertiary clays was to test the hypothesis that the presence of gold in the tertiary clays was an indicator of a primary deposit of gold in a deeper layer. That does not answer the question raised by the

⁸⁷ T17 p 870

⁸⁸ T10 p 253 - 254

⁸⁹ Applicant's Response to the Respondent's expert report prepared by Giles and Stolz and dated 23 March 2018 at p 28

⁹⁰ Exhibit 26, Middlemis Report at 3.1(k) p 33

exclusionary provision, namely whether the drilling was conducted for one of the purposes in the sub-section.

148. The evidence establishes that Havilah was investigating the tertiary clay for the purpose of finding gold so as to potentially bring forward project revenue. Havilah's interest in the tertiary clay was not merely as an indicator of a primary resource in the bedrock below. The gold found in the tertiary clays was not insignificant. Havilah reported in its quarterly activities report ending July 2013 that 'some drilling results were quite spectacular' in the tertiary clays.⁹¹ Similarly, Havilah's annual report for 2013⁹² recorded that the 'drilling program has outlined significant gold mineralisation in Tertiary clays lying on top of the Kalkaroo deposit.' Havilah said that the gold mineralisation in the tertiary clay 'could potentially be of economic value'⁹³

149. Mr Stolz gave evidence⁹⁴ that:

... the gold concentration was so high we then got the notion that maybe you could even mine this, and maybe you could even make money. We then drilled about another 50 holes at least and we tested that, and, yes, the gold was there but you couldn't make money.

150. The word 'deposits' is not defined in the ITAA 1997, but Dr Giles accepted in cross examination⁹⁵ the definition in the Geoscience Australia website that:

Mineral deposits are naturally occurring accumulations or concentrations of metals or minerals of sufficient size and concentration that might, under favourable circumstances, have economic value.

151. Havilah has avoided using the word 'deposit' to describe the gold in the tertiary clays, instead referring variously to 'the distribution of gold', 'the gold mineralisation', 'secondary mineralisation', 'some sort of secondary accumulation' and 'subeconomic levels of gold' in the clay subsurface.

⁹¹ Exhibit 2 tab 11, Quarterly Activities Report July 2013 p 4

⁹² Exhibit 2 tab 21, Annual Report 2013 p 13

⁹³ T10 p 253 - 254

⁹⁴ Transcript p 358 Stolz XN

⁹⁵ Transcript p 447 line 7 Giles XXN

152. I find that the 'significant gold mineralisation' found in the tertiary clays comes within the definition of a deposit and it follows that it is appropriate to describe the gold in the tertiary clays as a deposit. The elements of the exclusionary provision in s 255-25(2)(b) are satisfied because Havilah was exploring and drilling for gold in the tertiary clays for the purpose of determining more precisely the location, size and quality of deposits in the tertiary clays.
153. I accept the evidence from Havilah that there was another purpose for this activity namely to determine if the presence of gold in the tertiary clays was an indicator of gold in the bedrock below; but the existence of this purpose does not preclude the 'exploring or drilling for minerals' purpose that I have found. I also accept that, having explored for gold in the tertiary clays for the requisite purpose, Havilah determined that the extraction of the gold was uneconomic. The fact that the deposit was uneconomic does not mean that the exclusion cannot be satisfied. It is the purpose, and not the outcome, of the exploration that is relevant.
154. It is unnecessary for me to determine if the claimed activities are experimental activities pursuant to s 355-25(1) because the exclusion in s 355-25(2)(b) has been established. Nevertheless, in case I am wrong about the application of the exclusion, I will go on to consider whether the claimed core R&D activities are experimental activities.

Experimental activities?

155. The claimed experimental activities involved the collection of samples and data by a limited drilling program targeting gold in the tertiary clay. The results were entered into a database and plotted against drillhole traces in order to understand the distribution of gold. Further tests on particular samples gave Havilah an understanding of how the gold was fixed in the clay and how it could be recovered from the clay.⁹⁶ Mr Just, the field geologist from Havilah, was involved in carrying out this work.
156. There was no hypothesis written contemporaneously with the claimed activities for 2012/13 and 2013/14. It appears that the relevant hypothesis was first written on 13 May

⁹⁶ Transcript p 291 Giles XXN

2014 being the date of the application for registration. Unlike Portia and Maldorky, there were no contemporaneous reports prepared by consultants recording the activities.⁹⁷ I find that there was a lack of contemporaneous documentation that would be expected of activities carried out 'in a scientific way'.

157. As to whether the activities come within the definition of core R&D activities in s 355-25, I agree with Mr Middlemis, who said that the applicant was not testing a hypothesis but was rather undertaking a combination of gold exploration activities with mining process feasibility testing and optimisation.⁹⁸ The activities gave Havilah site specific information about the location of gold in the tertiary clay and how best it could be extracted. The outcome was determined using routine methods of investigation (sampling and testing). It was not an outcome that could 'only be determined by applying a systematic progression of work that ... proceeds from hypothesis to experiment, observation and evaluation, and leads to logical conclusions.'⁹⁹ There was no evidence of an hypothesis at the time of the claimed activities, nor any process of experiment, observation and evaluation. I find that the activities do not satisfy the elements of s 355-25(1)(a).
158. The alleged new knowledge as to the presence of gold in the tertiary clay was information that was site specific to Kalkaroo. It was generated from the application of routine methods of investigation involving sampling and testing at a particular site. The activities were not conducted for the purpose of generating new knowledge that was likely to benefit the wider Australian economy but rather for the purpose of acquiring site specific information for the sole benefit of Havilah and its shareholders. I find that the activities do not satisfy the elements of s 355-25(1)(b).
159. I find that the activities claimed by Havilah at Kalkaroo do not satisfy the elements of the definition of core R&D activities in s 355-25(1).

⁹⁷ Transcript p 301 Giles XXN

⁹⁸ Exhibit 26 at 3.1(b)

⁹⁹ Section 355-25(1)(a)(ii)

Conclusion

160. I have found that none of the activities claimed by Havilah were core R&D activities within the meaning of s 355-25(1). Supporting R&D activities is defined in s 355-20 to mean activities ‘*directly related*’ to core R&D activities. It follows that if the claims with respect to core R&D activities fail then so too must any claim for supporting R&D activities. I have not considered separately each of the claimed supporting R&D activities because they all must fail on this basis.

Decision of the Tribunal

161. The decision of the Tribunal is to affirm each of the decisions under review.

I certify that the preceding one hundred and sixty one [161] paragraphs are a true copy of the reasons for the decision herein of Deputy President Britten-Jones.

.....[Sgnd].....
Administrative Assistant Legal

Dated 16 April 2020