



**Rix's Creek Pty Limited; Bloomfield Collieries Pty Limited and  
Innovation Australia [2017] AATA 645 (10 May 2017)**

Division: GENERAL DIVISION

File Number(s): **2015/2095; 2098**

Re: **Rix's Creek Pty Limited; Bloomfield Collieries Pty Limited**

APPLICANT

And **Innovation Australia**

RESPONDENT

**DECISION**

Tribunal: **Senior Member A Poljak**

Date: **10 May 2017**

Place: **Sydney**

The decisions under review are affirmed.

.....[sgd].....

Senior Member A Poljak

### **Catchwords**

*INDUSTRY RESEARCH AND DEVELOPMENT – claims for research and development activities - definition of research and development activity in s73B(1) of the Income Tax Assessment Act 1936 (Cth) – whether claimed activities fall within definition – whether activities are systematic, investigative and experimental – whether activities involve either innovation or high levels of technical risk – whether activities themselves involve high levels of technical risk – purpose of the activities - whether claimed activities carried out as claimed – sufficiency of evidence – whether element of appreciable novelty – decisions under review affirmed*

### **Legislation**

*Administrative Appeals Tribunal Act 1975 (Cth) ss 35(2), (5)*

*Income Tax Assessment Act 1936 (Cth) ss 73B, (1), (2B)(b)(ii), (2C)*

*Industry Research and Development Act 1986 (Cth) ss 39S, 39T, as repealed by Tax Laws Amendment (Research and Development) Act 2011 (Cth)*

### **Cases**

*Commissioner of Taxation v Consolidated Media Holdings Ltd [2012] HCA 55; (2012) 250 CLR 503*

*Docklands Science Park Pty Ltd and Innovation Australia [2015] AATA 973; (2015) 68 AAR 42*

*Mount Owen Pty Ltd and Innovation Australia [2013] AATA 573; (2013) 137 ALD 88*

*RACV Sales and Marketing Pty Ltd and Innovation Australia [2012] AATA 386; (2012) 57 AAR 268*

### **Secondary Materials**

*Explanatory Memorandum, Taxation Laws Amendment Bill (No 3) 1996 (Cth)*

*Explanatory Memorandum, Income Tax Assessment Amendment (Research and Development) Act 1986 (Cth)*

## REASONS FOR DECISION

Senior Member A Poljak

10 May 2017

1. These proceedings concern the review of two decisions of the delegate of Innovation Australia (“the **respondent**”), pursuant to s39T of the *Industry Research and Development Act 1986* (Cth) (the “**IRD Act**”), made under s39S dated 10 December 2013 (Notice dated 11 December 2013), as partly confirmed and partly varied by the decisions of the respondent dated 31 March 2015 under s39L (the “**reviewable decisions**”).
2. The reviewable decisions, in effect, find that a number of the activities, which were claimed by Rix's Creek Pty Limited and Bloomfield Collieries Pty Limited (“the **applicants**”) to be research and development activities, were not “research and development activities” (“**R&D**”) within the meaning of s73B of the *Income Tax Assessment Act 1936* (Cth) (the “**ITAA**”).

## OVERVIEW AND ISSUES

3. There are three types of projects in which the claimed activities took place, namely:
  - (a) the Dense Media Sampler device project at Bloomfield (“**DMS Project**”);
  - (b) the project to substitute refined recycled waste oil for diesel for use in explosives at both Rix’s Creek and Bloomfield (the two “**Explosives Projects**”); and
  - (c) excavator bucket redesign and truck pass matching on two excavators at Rix’s Creek and one excavator at Bloomfield (the three “**Excavator Projects**”).
4. There are six projects in total, across three different categories and at two different mine sites. It is uncontroversial that all the claimed activities took place in the context of two working mines. The claimed activities were undertaken at the Rix’s Creek mine in Singleton (operated by Rix’s Creek Pty Limited) and the Bloomfield mine in East Maitland (operated

by its related entity Bloomfield Collieries Pty Limited) in the period April 2008 to March 2012 inclusive.

5. An overview of the projects and issues are as follows:

**Rix's Creek**

**'Explosives Project'** – Development of a new process for producing explosives using recycled refined oil from Rix's Creek machinery

<b>Activity Number</b>	<b>Activity Title</b>	<b>Issue</b>
A1	<i>Preliminary work and background research</i>	<i>Depends on A2 (relationship accepted by respondent)</i>
A2	<i>Design, development and investigation of concept</i>	<i>Whether core activity</i>
A3	<i>Trial and testing</i>	<i>Whether directly related</i>
A4	<i>Feedback and monitoring</i>	<i>Depends on A2 (relationship accepted by respondent)</i>

**'Excavator Project'** – Design and development of an improved bucket for the EX 3600 excavator in order to increase the payload achieved per pass

<b>Activity Number</b>	<b>Activity Title</b>	<b>Issue</b>
B1	<i>Preliminary work and background research</i>	<i>Depends on B2 and B4 (relationship accepted by respondent)</i>
B2	<i>Design, development and investigation of concept</i>	<i>Whether core activity</i>
B3	<i>Testing and analysis</i>	<i>Whether directly related</i>
B4	<i>Feedback R&amp;D – modification and redesign</i>	<i>Whether core activity</i>
B5	<i>Feedback and monitoring</i>	<i>Depends on B2 and B4 (relationship accepted by respondent)</i>

**'Excavator Project'** – Design and development of new processes and devices to increase load haul cycle efficiency in removing overburden at the Rix's Creek open cut mine (EX 5500 excavator)

<b>Activity Number</b>	<b>Activity Title</b>	<b>Issue</b>
C1	Preliminary work and background research	Depends on C2 (relationship accepted by respondent)
C2	Design, development and investigation of concept	Whether core activity
C3	Testing and analysis	Whether directly related
C4	Evaluation and Feedback R&D	Depends on C2 (relationship accepted by respondent)

### **Bloomfield**

**'DMS Project'** – Design and development of a new heavy-density media sampling device

<b>Activity Number</b>	<b>Activity Title</b>	<b>Issue</b>
A1	Design, development and investigation of concept	Not in issue
A2	Trial and testing	Whether directly related
A3	Analysis and evaluation	Whether directly related
A4	Modification and redesign	Whether directly related (whether core activity not pressed)
A5	Feedback and monitoring	Not pressed

**'Excavator Project'** – Development of new methods for removing overburden to improve mine life and operation efficiency & design and development of new and improved processes and devices for removing ROM product and overburden materials to improve mine life and operational efficiency

<b>Activity Number</b>	<b>Activity Title</b>	<b>Issue</b>
B1	Preliminary work and background research	Depends on B2 and B4 (relationship accepted by respondent)
B2	Design development and investigation of concept	Whether core activity
B3	Testing and Analysis	Whether directly related

<i>B4</i>	<i>Modification and redesign</i>	<i>Whether core activity</i>
<i>B5</i>	<i>Feedback and monitoring</i>	<i>Depends on B2 and B4 (relationship accepted by respondent)</i>

**‘Explosives Project’** – Design and Development of a new process for replacing diesel fuel in the manufacture of bulk explosives incorporating recycled refined oil from mine machinery

<b>Activity Number</b>	<b>Activity Title</b>	<b>Issue</b>
<i>C1</i>	<i>Preliminary work and background research</i>	<i>Depends on C2 (relationship accepted by respondent)</i>
<i>C2</i>	<i>Design development and investigation of concept</i>	<i>Whether core activity</i>
<i>C3</i>	<i>Trial and testing</i>	<i>Whether directly related</i>
<i>C4</i>	<i>Feedback R&amp;D - Modification and redesign</i>	<i>Depends on C2 (relationship accepted by respondent)</i>

6. The applicants submit that the claimed activities are R&D activities under s73B(1) of the ITAA, and specifically that:

(a) The DMS Project activities (described as Activities A2 to A4) were carried on for a purpose of testing and modifying the successive designs of Prototype 5, which is “a purpose directly related to the carrying on” of the design and development of Prototype 5 within the meaning of paragraph (b) of the s73B(1) definition of R&D activities.

(b) In the Explosive Projects:

(i) The design and development (A2/C2) and, at Rix’s Creek, the laboratory testing (A2 or A3) and certain trial blast activities (part of A3), were within the meaning of paragraph (a) of the s73B(1) definition of R&D activities.

(ii) The balance of the trial blast activities (A3/C3) were carried on for a purpose of testing the experimental fuel mixes, which is within the meaning of paragraph (b) of the s73B(1) definition of R&D activities.

(iii) The respondent accepts that activities AC/C1 and A4/C4 are directly related to A2/C2 respectively.

(c) In the Excavator Projects:

- (i) The design and development (B2/C2), modification and redesign (B4) and evaluation and feedback (C4) activities were within the meaning of paragraph (a) of the s73B(1) definition of R&D activities.
- (ii) The testing and analysis (B3/C3) each project, and activities C1, C3 and C4 for the Rix's Creek EX 5500 project, were each carried on for "a purpose directly related to the carrying on" of activities B2/C2 and B4/C4 within the meaning of paragraph (b) of the s73B(1) definition of R&D activities.
- (iii) The respondent accepts that B1 and B5 of each of the Bloomfield project and Rix's Creek EX3600 projects are directly related to B2 and B4 respectively, and the same for C1 and C4 of the Rix's Creek EX5500 project.

7. The respondent contends that the applicants are seeking to characterise ordinary mining processes as R&D activities and that the claimed activities comprised the routine operation of the Bloomfield coal handling preparation plant (DMS Project), the substitution of one fuel for another, and not the creation of a new product (Explosives Projects), and the customisation of buckets to site-specific conditions (Excavator Projects).

#### **RELEVANT LEGISLATIVE PROVISIONS AND APPLICABLE PRINCIPLES**

8. The respondent, in conjunction with the Commissioner of Taxation, was responsible for the administration of the Commonwealth tax concession scheme for research and development expenditure ("the Concession Scheme").
9. The framework for the tax Concession Scheme for research and development expenditure is provided by ss 78B to 73Z of the ITAA and the IRD Act. The applicable legislation is that which was in effect prior to the amendments introduced by the *Tax Laws Amendment (Research and Development) Act 2011* (Cth), which came into effect on 8 September 2011.
10. The objects of section 78B of the ITAA are set out in s73B(1AAA):

*Object of this section*

*(1AAA) The object of this section is to provide a tax incentive, in the form of a deduction, to encourage research and development activities in Australia and make eligible companies more internationally competitive by:*

- (a) *encouraging the development by eligible companies of innovative products, processes and services; and*
- (b) *increasing investment by eligible companies in defined research and development activities; and*
- (c) *promoting the technological advancement of eligible companies through a focus on innovation or high technical risk in defined research and development activities; and*
- (d) *encouraging the use by eligible companies of strategic research and development planning; and*
- (e) *creating an environment that is conducive to increased commercialisation of new processes and product technologies developed by eligible companies.*

***The benefits of the tax incentive are targeted by being limited to particular expenditure on certain defined activities. [Emphasis added]***

11. Section 73B(1) of the ITAA defines “research and development activities” as follows:

***research and development activities*** means:

- (a) *systematic, investigative and experimental activities that involve innovation or high levels of technical risk and are carried on for the purpose of:*
  - (i) *acquiring new knowledge (whether or not that knowledge will have a specific practical application); or*
  - (ii) *creating new or improved materials, products, devices, processes or services; or*
- (b) *other activities that are carried on for a purpose directly related to the carrying on of activities of the kind referred to in paragraph (a).*

***research and development expenditure***, in relation to an eligible company in relation to a year of income, means expenditure (other than core technology expenditure, interest expenditure, feedstock expenditure, excluded plant expenditure or expenditure incurred in the acquisition or construction of a building or of an extension, alteration or improvement to a building) incurred by the company during the year of income, being:

- (a) *contracted expenditure of the company;*
- (b) *salary expenditure of the company, being expenditure incurred on or after 1 July 1985; or*
- (c) *other expenditure incurred on or after 1 July 1985 directly in respect of research and development activities carried on by or on behalf of the company on or after 1 July 1985;*

*and includes any eligible feedstock expenditure that the company has in respect of the year of income in respect of related research and development activities.*

12. The definition of “research and development activities” is in two limbs: the first is commonly referred to as “core activities” and the second is commonly referred to as “supporting activities” or “directly related activities”.

13. For the purposes of the definition of **research and development activities** in sub-s73B(1); s73B(2B) provides:

- (a) *activities are not taken to involve innovation unless they involve an appreciable element of novelty; and*
- (b) *activities are not taken to involve high levels of technical risk unless:*
  - (i) *the probability of obtaining the technical or scientific outcome of the activities cannot be known or determined in advance on the basis of current knowledge or experience; and*
  - (ii) *the uncertainty of obtaining the outcome can be removed only through a program of systematic, investigative and experimental activities in which scientific method has been applied, in a systematic progression of work (based on principles of physical, biological, chemical, medical, engineering or computer sciences) from hypothesis to experiment, observation and evaluation, followed by logical conclusions.*

14. Relevantly, s73B(2C) provides:

*For the purposes of this section, the following activities are taken not to be systematic, investigative and experimental activities:*

- (a) *market research, market testing or market development, or sales promotion (including consumer surveys);*
- (b) *quality control;*
- (c) *prospecting, exploring or drilling for minerals or natural gas for the purpose of discovering deposits, determining more precisely the location of deposits or determining the size or quality of deposits;*
- (d) *the making of cosmetic modifications or stylistic changes to products, processes or production methods;*
- (e) *management studies or efficiency surveys;*
- (f) *research in social sciences, arts or humanities;*
- (g) *the making of donations;*
- (h) *pre-production activities such as demonstration of commercial viability, tooling-up and trial runs;*
- (i) *routine collection of information, except as part of the research and development process;*
- (j) *preparation for teaching;*
- (k) *commercial, legal and administrative aspects of patenting, licensing or other activities;*
- (l) *activities associated with complying with statutory requirements or standards, such as the maintenance of national standards, the calibration of secondary standards and routine testing and analysis of materials, components, products, processes, soils, atmospheres and other things;*
- (m) *specialised routine medical care;*

- (n) *any activity related to the reproduction of a commercial product or process by a physical examination of an existing system or from plans, blueprints, detailed specifications or publically available information.*

**Research and development activities (s73B(1) of the ITAA)**

**Paragraph (a): “core” R&D activities**

**Systematic, Investigative and Experimental**

15. In *RACV Sales and Marketing Pty Ltd and Innovation Australia* [2012] AATA 386; (2012) 57 AAR 268, the Tribunal set out at [159] the relevant ordinary meanings of the words systematic, investigative and experimental:

“systematic”:	“... <b>1</b> Making use of, or carried out according to, a clearly worked-out plan or method. <b>2</b> methodical...”
“investigative”:	“... to carry out a thorough, detailed, and often official inquiry into, or examination of, something or someone...”
“experimental”:	“... <b>1</b> consisting of or like an experiment. <b>2</b> relating to, or used in, experiments. <b>3</b> trying out new styles and techniques...”
[“experiment”:	“... <b>1</b> trial carried out in order to test a theory, a machine’s performance, etc or to discover something unknown. <b>2</b> the carrying out of such trials. <b>3</b> an attempt at something original...”]

16. No particular label or form of words is necessary or required when describing an activity. The question is whether what was done was, in substance, systematic, investigative and experimental. However in saying that, what is done must be carried out in accordance with a system, plan or organised method.

17. In determining the intended meaning of ‘systematic, investigative and experimental’ regard must be had to the relevant extrinsic material. While the relevant extrinsic material does not, of course, replace the statutory language, it informs the proper construction and meaning of the statutory text. The High Court said in *Commissioner of Taxation v Consolidated Media Holdings Ltd* [2012] HCA 55; (2012) 250 CLR 503 at [39]:

*The statutory text must be considered in its context. That context includes legislative history and extrinsic materials. Understanding context has utility if, and in so far as, it assists in fixing the meaning of the statutory text. Legislative history and extrinsic materials cannot displace the meaning of the statutory text. Nor is their examination an end in itself.*

18. The *Explanatory Memorandum, Taxation Laws Amendment Bill (No 3) 1996* (Cth) (the “**Explanatory Memorandum 1996**”) at [9.52], states that “*the definition of ‘research and development activities’ will be made more explicit by importing concepts from the Explanatory Memorandum to the Income Tax Assessment Amendment (Research and Development) Act 1986*” (the “**Explanatory Memorandum 1986**”), which, at page 14, explains:

*For the purposes of the definition of “research and development activities”, the reference to systematic, investigative or experimental activities means that the scientific method is applied in a systematic progression of work from hypothesis to experiment, observation and evaluation, followed by logical conclusions.*

19. This explanation in the Explanatory Memorandum 1996 was given statutory force in s73B(2B)(b)(ii) of the ITAA, which defines ‘high levels of technical risk’ by referencing part to the notion of systematic, investigative and experimental activities and provides:

*...the uncertainty of obtaining the outcome can be removed only through a program of systematic, investigative and experimental activities in which **scientific method has been applied**, in a systematic progression of work (based on principles of physical, biological, chemical, medical, engineering or computer sciences) **from hypothesis to experiment, observation and evaluation, followed by logical conclusions.** [Emphasis added]*

20. It appears to be common ground between the parties that the words systematic, investigative and experimental together connote application of the scientific method in a systematic progression of work from hypothesis to experiment, observation and evaluation, followed by logical conclusions. Senior counsel for the applicant accepted at hearing that activities were not systematic, investigative and experimental, unless one can find a systematic process which is that of a hypothesis followed by experiment, followed by observations and evaluation of the results. Evidence must be available to satisfy to satisfy this requirement. Vague, generalised description of the claimed activities is not sufficient to establish that a hypothesis was formulated and that the activities claimed were carried out to test that hypothesis. An ex post facto attempt to construct or discover a hypothesis with the benefit of hindsight after the workers can carried out will not satisfy the requirement that the activities be “systematic, investigative and experimental”; see *Mount Owen Pty Ltd and Innovation Australia* [2013] AATA 573; (2013) 137 ALD 88 at [197], [209], [229] and [241].
21. While the creation and provision of documentation is not a statutory requirement to substantiate the R&D activities, I agree with the submissions of the respondent that documentary evidence is an expected feature of an activity that is systematic, investigative

and experimental. Documentation is necessary to record the activity undertaken, its purpose, progress and, of course, the results of the activities and the evaluation of those results. Without such documentation, it is near impossible to establish the progression of the activities undertaken and that the purpose of the activities was to generate new knowledge in the form of new or improved materials, products, devices, processes or services. It follows, that without such documentation, the experimental activity would have limited application or future use.

22. This is consistent with what the Tribunal has previously said in *Docklands Science Park Pty Ltd and Innovation Australia* [2015] AATA 973; (2015) 68 AAR 42 at [63]:

*...documentation is necessary to substantiate the R&D activities claimed by an applicant. It is the absence of documentation which has resulted in [the Tribunal's] findings. Such documents are required for the purpose of evidencing experimental activities whose outcome cannot be known or determined in advance but can only be determined by applying a systematic progression of work based on established science; and which proceeds from hypothesis to experiment, observation and evaluation and leads to logical conclusions. That process will establish that the purpose of conducting the activities is to generate new knowledge in the form of new or improved materials, products, devices, processes or services. **An applicant cannot succeed in establishing those requirements in the absence of detailed documentation recording the process of each activity as it develops.** [Emphasis added]*

23. The applicants appear to rely on R&D Project Plans in order to prove the existence of documented plans to substantiate that the claimed activities were systematic, investigative and experimental. No occasion arises in these proceedings for me determine the question of whether the applicant's complied with the statutory requirement to have a plan in accordance with certain Guidelines formulated under s73B(2BA) of the ITAA and s39KA of the IRD Act. However, it is accepted by the parties that the content and form of the R&D Project Plans complied with the Guidelines.

24. At hearing, Mr Booth admitted that, although his name appeared on several of the R&D Project Plans, he had not seen the documents until they were shown to him at hearing. In explanation of why his name appeared on the documents, Mr Booth advised that *"we- that is Terry Brown and myself, formed the research and development – or R and D section of the business and whilst I did not write this and haven't seen it...because I am part of the team, my name is on there but I have definitely not seen this document"*. He said that R&D Project Plan documents were *"a standard document...recording the information needed to*

*substantiate that project and that was a moving document. It was a document you could pull that up on the screen a month or a year later and add to it”.*

25. I am not convinced that the R&D Project Plans were created to inform and guide the claimed activities. The documents are vague and highly generalised in nature and contain both broad and high-level, undifferentiated descriptions of the activities over a period of several years, some prospective and some apparently after the event. It is also not clear who prepared and updated the R&D Project Plans and to what extent they may be attended by the risk of retrospective reconstruction, inference, attribution or purpose. Mr Booth said at hearing that the R&D Project Plans were not necessarily prepared for the purpose of substantiating the R and D projects but rather to “*submit...for appraisal, inspection or authorisation to our higher authorities or our – or the consultants that were overseeing any of our R and D projects*”. Accordingly, I am not satisfied that the R&D Project Plans are sufficient to substantiate that the claimed activities were systematic, investigative and experimental.

#### *Involving Innovation*

26. Pursuant to s73B(2B)(a) of the ITAA, activities are not taken to involve innovation unless they involve an **appreciable** element of novelty.

27. The Explanatory Memorandum 1996 at [9.56], explains:

*Innovation is to involve an appreciable element of novelty. This means that a **fairly large constituent part of the activity must** involve novelty. [Emphasis added]*

28. This explanation is consistent with the ordinary meaning of the word “appreciable” being “*large or important enough to be noticed*”, “*Noticeable; significant; able to be measured or noticed*” and “*significant in some way*”.

29. Given the statutory context, including the extrinsic material, an element of novelty that is not a fairly large constituent part of the activity would not suffice as innovation.

#### *Involving High Levels of Technical Risk*

30. Activities are not taken to involve high levels of technical risk unless they meet the specific criteria set out in s73B(2B)(b) of the ITAA:

- (i) *the probability of obtaining the technical or scientific outcome of the activities cannot be known or determined in advance on the basis of current knowledge or experience; and*
- (ii) *the uncertainty of obtaining the outcome can be removed only through a program of systematic, investigative and experimental activities in which scientific method has been applied, in a systematic progression of work (based on principles of physical, biological, chemical, medical, engineering or computer sciences) from hypothesis to experiment, observation and evaluation, followed by logical conclusions.*

31. In *RACV* the Tribunal said at [221]:

***It is not enough that the outcome cannot be known or determined in advance. Section 73B(2B)(b)(ii) is addressed to the criterion in s 73B(2B)(b)(i) that the outcome cannot be known or determined. It effectively defines the only means by which uncertainty of obtaining an outcome can be removed. It requires that the uncertainty of obtaining the outcome can only be removed through a program of activities that must meet the description it sets out. That means that the not knowing or not being able to determine, and so the **uncertainty, of obtaining the technical or scientific outcome can be removed only through that program of activities.** Removing that uncertainty does not mean ensuring that a particular technical or scientific outcome is assured. It has nothing to do with a particular outcome and everything to do with being able to assess whether a particular technical or scientific outcome can be obtained at all. [Emphasis added]***

*Carried on for the purpose of acquiring new knowledge or creating new or improved materials, products, devices, processes or services*

32. To qualify as a research and development activity, an activity must be carried on for **the purpose** of acquiring new knowledge or creating new or improved materials, products, devices, processes or services. The “*purpose*” is to be determined by reference “*to the aims and objectives of the activity before and during the carrying out of*” the activities; *Mount Owen* at [154]. It is not determined according to “*a rationale developed at a later time to explain why...those activities were carried on*”; *RACV* at [227].

33. In *Mount Owen*, the Tribunal said at [184]:

*The consequence that some new knowledge about the efficiency and utility of mining methods may have incidentally resulted as an outcome of an activity does not mean that this was a purpose of the activity, or that it involved research and development, or that it was pursuant to or resulted from an experiment, or tested any hypothesis.*

34. There is disagreement between the parties about whether the “*purpose*” requirement in the definition of ‘research and development activities’ in s73B(1)(a) refers to the dominant purpose or a significant purpose.

35. When considering the intention of the statutory language, it is helpful to look at the context. The objects of s73B of the ITAA are to provide a tax incentive which encourages research and development in Australia; the benefits of which are **targeted** by being **limited** to particular expenditure on certain defined activities.

36. The Tribunal has previously dealt with the point-in-time legislation applicable in these proceedings. In *Mount Owen*, the Tribunal said (in obiter dicta) at [149]-[151]:

*[149] In this case there is an important dispute between the parties as to whether the reference to “purpose” in paragraph (a) of the definition of research and development in the ITAA is to the **dominant** purpose of the activities claimed or, as the applicant contends, to a **significant** purpose which may be one of a number of different purposes but not necessarily dominant.*

*[150] In his reasoning in relation to paragraph (b) of the definition of research and development activities in the Industry Research Case, Lindgren J concluded that the expression “a purpose” does not require that there should be a sole dominant or primary purpose but that it is sufficient if one of a number of purposes of the activity is the carrying on of one or more of the core activities. In reaching this conclusion His Honour focused on the use of the word “a” in that provision. He contrasted this with the use of the word “the” in paragraph (a) of the definition where reference is made to “the purpose of” acquiring new knowledge or creating new processes.*

*[151] The reasoning of His Honour in respect of the difference in expression between the two paragraphs of the definition in s 73B in our view supports the Respondent’s contention that the words “the purpose” impose a requirement that the purpose be at least a dominant purpose.*

37. In any event, it will only be necessary to resolve the construction dispute in this case if I am satisfied that it has been shown, in respect of any of the claimed activities, that they were carried on for at least a **significant** purpose of acquiring new knowledge or for creating new or improved materials, products, devices, processes or services.

***Paragraph (b): “directly related” activities***

38. With respect to non-core activities, in order to qualify as research and development, the claimed activity must be carried on for a purpose “directly related” to the carrying on of core activities pursuant to s73B(1)(b) of the ITAA. This requires a *direct and close* relationship between the related activity and the carrying on of the core research and development activity; *Mount Owen* at [153]. This is common ground.

## CONSIDERATION

### DMS PROJECT – ACTIVITIES A1 TO A5

39. The DMS project is the design and development of Prototype 5 of the DMS device and its testing within the coal handling and preparation plants (“**CHPP**”) at the Bloomfield mine. The DMS device measures the density of the medium used to separate coal from non-coal material in the CHPP.
40. Mr Booth, an employee of the applicant, Bloomfield Collieries Pty Limited (“**Bloomfield**”), invented the DMS device and holds the patents for the invention in Australia, the United States and South Africa. Mr Booth started the process of inventing the DMS at Bloomfield in 2006. In the period 2006 to April 2008, Bloomfield successively designed and tested prototypes 1, 2, 3 and 4. The respondent has accepted that the work on the DMS in the period 2006 to April 2008 was within the s73B(1) definition of ‘research and development activities’.
41. The respondent has accepted that the design, development and investigation of the concept for Prototype 5 of the DMS device from 2008-2012 (Activity A1) was a paragraph (a) (core) research and development activity.
42. Bloomfield no longer contends that the modification and redesign of Prototype 5 (Activity A4) is a paragraph (a) (core) activity. Further, Bloomfield does not press its claim in respect of feedback and monitoring (Activity A5).
43. Accordingly, the issues in dispute in these proceedings is whether the trial and testing (Activity A2), analysis and evaluation (Activity A3) and modification and redesign (Activity A4) activities were carried on for a purpose “*directly related*” to the carrying on of the design, development and investigation of concept for Prototype 5.
44. I have carefully read and considered the witness statements (including exhibits) of Mr Robert Booth filed in these proceedings dated 16 November 2015, 18 February 2016 and 4 October 2016. I have also carefully considered his oral evidence given at hearing.
45. I have also carefully read and considered the expert reports (including exhibits) of Mr Andrew Swanson dated 1 February 2016 and 26 September 2016, and the expert report

(including exhibits) of Dr Andrew Vince dated 31 August 2016. I have also carefully considered the joint memorandum prepared on 27 October 2016 and the oral evidence given by both Dr Vince and Mr Swanson at hearing.

**Activity A2 – Trial and Testing (“directly related”)**

46. As already outlined above, in order for me to be satisfied that the trials and testing were necessary to carry on the design, development and investigation of Prototype 5, I must be satisfied that there is a **direct and close or immediate relationship** between **the purpose** of the claimed trials and testing and the carrying on of the design, development and investigation of Prototype 5.
47. The respondent contends that there is a disparity between the extent of the trialling and testing claimed in the design activities encapsulated in the accepted paragraph (a) activity and contends that the claimed trial and testing activities amounted in substance to running the Bloomfield coal plant as it would normally be run for a period of some years. The respondent further contends that the activities claimed as trial and testing were, on any view, carried out for a commercial purpose; but accepts that there may be the possibility of there being a parallel purpose that is directly related to the carrying on of the design, development and investigation of Prototype 5.
48. It is agreed between the experts that extended testing of instruments in the CHPP is required to ensure that they can perform reliably under challenging conditions, with predictable wear lives for key components. However, Dr Vince is of the opinion that wear life increase is a commissioning/maintenance activity; Mr Swanson is of the view that extended testing/monitoring is essential to the development of a reliable device.
49. In any event I think it is plain on the evidence that the so-called “*trial and testing*” activities coincided with the normal operations of the CHPP. At hearing, Mr Booth agreed and said that it was “*opportunistic*” to “*take...advantage*” of the running of the plant to test the device. He conceded that in the period 1 April 2008 to 31 March 2012, the coal plant was going to run “*in any event*”.
50. In the period 2008 to 2012, Mr Booth’s work on the device was “*focused particularly upon the design of the sampling element and the collection chamber, including the screen*”.

*component and the orifice used in these respective components*". The specific design improvements to Prototype 5 during this period; as accepted by the respondent were:

- *valve and orifice development including investigation into orifice design and materials and development of the ceramic orifice (2009/2010);*
- *density measurement chamber development including investigation of the flow patterns through the media sampler, removal of proud welds, shape of the element (2008/2009 and 2010/2011);*
- *collection chamber development including investigation into the relationship between the collection jacket and the live flow between the self-relieving wedge wire screen and the outer pipe (2010/2011); and*
- *element refinement and assessment of effects of feed quality (2011/2012).*

51. At hearing, Mr Booth conceded that despite the evidence in his witness statement, the alleged changes to the shape and material of the orifice in Prototype 5, namely the shape (circular) and material (ceramic), were in fact developed in Prototype 4.

52. Mr Booth asserted that the "*testing and trialling*" of Prototype 5 in the CHPP was "*fundamental to the ultimate design of the Dense Media Sampler*". He said that by 2008, the beginning of the relevant period for which the deduction is claimed "*the general concept of the design was sufficiently developed to allow the device prototype to be incorporated into the Bloomfield plant for testing on a real flows and refinement of the design using the data from testing*". He said that "*whilst the basic concepts of the design had been established and the results were promising, Prototype 5 was not yet fully operational.*" In his witness statement dated 16 November 2015, Mr Booth says at paragraph [103]:

*In order to commercialise the Dense Media Sampler and to make it fully operational, I knew that further design work on the components of the Dense Media Sampler was required such as: orifice operating range for each feed pressure, effects of particle size analysis within the pulp feed, aspects of the screen design, effects of multiple installations within a processing circuit, the reason for the apparent density reading offset and how to rectify this error.*

53. The respondent contends that the alleged design activities were modest advances involving improvements to the materials, shape and size of known elements of the device. Dr Vince opined in his expert report dated 31 August 2016, that "*the changes that occurred*

were peripheral and non-core in nature and as such **only tinkered with the overall design outcome**". [Emphasis added]

54. The respondent further contends that the evidence does not establish the requisite purpose. I agree for the following reasons.
55. In regards to the modifications to the lining of the collection chamber, Mr Booth's evidence at hearing was that the DMS devices were installed in the processing plant with a particular lining and left to wear "*to failure*", and were not removed until "*catastrophic failure*" (in the case of the basalt lining), or until it was "*decommissioned*" (in the case of the ceramic lining). Mr Booth did not have any records of how long the trial went for, nor any records of comparisons in the performance of the basalt, ceramic or steel linings.
56. At hearing Dr Vince opined that the scale and time period of testing the collection chamber was that a "*maximum one circuit, initial period of one week between maintenance*" was appropriate.
57. In regards to the testing of the wear on the wire screen element, Mr Booth says in his witness statement dated 16 November 2015, at [129]:

*For each change made to the physical designs of the element, I needed to assess the pattern of wear of the edges of the screen and the wedge wire. **The wear data produced allowed the next design iteration of the element to be developed.** This testing had to occur over a period of months, in a real feed environment, as the critical data required for the development of the screen was the wear rate of the edge of the wire. The screens being tested or inspected regularly and observations made with regard to wear, aperture size and any other related operational problems. [Emphasis added]*

58. There is no record of the "*wear data*" or how it informed the design. At hearing, Mr Booth's evidence was that there were periodic measurements taken; but not recorded. The only report before me is a Density Media Report prepared by Terry Brown of the screen element being replaced in circuits 1A and 1B during the period 2010 to 2011.
59. In regards to the development of the size of the orifice in the so-called "*blockage trial*", there is no documentary evidence of that trial. It is Mr Booth's evidence that "*specific trials*" were conducted in a one-week period from 14 January 2009 to 20 January 2009. The only document alleging to contain the results of the trial is dated 4 September 2009, **after** the dates of the claimed trials. There is also a spreadsheet recording the cyclone pressure

observed during the test in the calculations of the flow rates through the orifice; however this document is undated.

60. Mr Booth's evidence is that the blockage trial provided boundaries within which there would be flow through the orifice but it did not test the functionality or effectiveness of the orifice which need to be tested over a longer term. Mr Booth states in his witness statement dated 16 November 2015 at [151], "*in the subsequent longer term trials, we also tested different designs of the orifice (shape, materials, etc), not just the size*". In contrast, Dr Vince's opinion in relation to the blockage trial was that preliminary work could be done "*very cheaply and very straightforward, very measurably without having to run it in very large multi-million-dollar operation called a coal preparation plant*". He opined at hearing that you could "*do it in the laboratory. You could get a university to do similar tests...it's small scale*". He further opined at hearing that "*most of the work – 80 per cent of the work would be small-scale work in 20 per cent would be the big scale work so you've got it under control, you've worked out what your prime variables are that you need to consider before you go and play with the big machine – multimillion dollar coal preparation plant*". He said that "*jumping in and seeing if it holds out*" is not an approach he would use.
61. The evidence does not establish a relationship between the routine operations of the CHPP said to double as "*trial and testing*" in the development of the orifice, other than the assertion that long term large-scale testing was needed. In regards to the claimed trial of different size orifices with screen area variations; evidence suggests that the trial took at most two days.
62. The respondent contends that the claimed design and development of Prototype 5 was modest, and the claimed ancillary activities, said to have been carried on for a "*purpose of testing and modifying the successive designs of Prototype 5*", were manifestly excessive.
63. While the question of whether or not the activities were "*excessive*" is not a question that the Tribunal must determine, it is relevant to look at the nature and extent of the activities undertaken to determine whether there is a *direct and close* relationship between the related activity and the carrying on of the core research and development activity. In other words, the factual question of the extent of the claimed paragraph (b) (directly related) activities is one which plainly bears upon the question of the characterisation; whether the requisite relationship exists.

64. Bloomfield contends that the trial and testing activities for Prototype 5 were not excessive; they were the activities that Mr Booth in his professional judgement considered necessary for the proper design of the device. In his witness statement dated 16 November 2015 at [190] and [193], Mr Booth says that it was important to test the DMS in real life conditions as he “*needed to test each design iteration of the dense media sampler over a sufficient period of time to assess the impact of different conditions in the CHPP in terms of wear on components and other factors, such as susceptibility to blockages*”, then incorporated the results into his design work and “*changed to testing a different feature or function*”.
65. Dr Vince opined in his report dated 31 August 2016 at pg. 32(d), that:
- ...the trials and testing and subsequent A&E activities were **grossly excessive not only in extent but also in time**. That is, in my opinion, trials and testing could have been conducted over a shorter timeframe and utilised a fraction of the plant rather than the whole. They were also **unnecessarily highly repetitive** in nature. The **excessive level of testing** in my opinion is **disproportionate to the level of risk it attempts to mitigate**. [Emphasis added]*
66. At hearing, Dr Vince reiterated that in his opinion, the period and scale of testing was “*manifestly*” and “*vastly*” excessive.
67. The claimed design and development of Prototype 5 was relatively modest, and the claimed ancillary activities, said to have been carried on for a “*purpose of testing and modifying the successive designs of Prototype 5*”, were excessive. I am not convinced the evidence demonstrates the requisite direct relationship.
68. Additionally, Bloomfield has claimed for activities conducted on four devices installed in the parallel circuits at Bloomfield (that is in circuits 1A, 1B, 2A and 2B). Mr Booth says in his witness statement dated 16 November 2015 at [104], that installing Prototype 5 in four different locations across the plant allowed comparisons to be made between the same prototypes operating with different parameters and parts, although conceded that “*the main focus of our testing was in the first two circuits, 1A and 1B*”.
69. Mr Booth’s evidence (at [105]) is that having four devices allowed variables to be tested simultaneously across two different types of circuit, “*involving as they did different feed material*”. Mr Booth states that testing variants of the screen element in different feeds is an example of simultaneous testing across different types of circuits. In his reply evidence witness statement dated 4 October 2016, Mr Booth states at [7] that “*testing the DMS on*

*multiple circuits within the dense medium circuit meant that we could test two different iterations of Prototype 5 simultaneously, or one new iteration and a control at the same time”.*

70. Dr Vince opined in his expert report at [4.4.1 (b) and (e)], “80% of the outcome could have been achieved by only doing the work on one of the [dense medium circuit (DMC)] modules. I would have selected one of the high density modules” and considered “*trailing in all four circuits simultaneously to be excessive with the result at least doubling the work in this activity*”. In his reply evidence witness statement dated 4 October 2016, Mr Booth states at [7] that “*had we been testing only one DMS device prototype, i.e. installed in only one quarter of the circuit, we would have had to test the design changes sequentially and the trial would have taken longer*”.

71. Although conceding that some information may be lost by doing the work on one of the DMC modules, Dr Vince says at [4.4.1(k)]:

*...the Bloomfield plant comprises a high density dense medium circuit followed by another high density dense medium circuit. These two circuits are duplicated in the plant, i.e. there are four dense medium circuits. It is my opinion, that at most **only two circuits** should have been included in the trial as they would have given the **same information at half the cost.** [Emphasis added]*

72. While I accept that the use of one circuit as the ‘control’ against which changes can be measured, I am not convinced that the evidence before me substantiates the use made of the four circuits during the period 2008 to 2012 to sufficiently justify the claim.

**Activity A3 – Analysis and Evaluation; Activity A4 – Modification and Redesign: (“directly related”)**

73. It appears to be agreed between the parties that there is potential for overlap between the categories, and arbitrariness about whether lines are to be drawn between the categories of activity. Accordingly, the same considerations apply to Activities A3 to A4 as applied to Activity A2.

74. On that basis, I am satisfied that these activities are not “*research and development activities*” for the same reasons as in relation to Activity A2.

## **EXPLOSIVES PROJECTS – ACTIVITIES C1 TO C4**

75. During the period 2008 to 2012, the mines at both Rix's Creek and Bloomfield comprised open pit coal mines. It is not contested that the geology of Rix's Creek and Bloomfield mines are very different. The rock geology at Rix's Creek consists predominantly of sandstone, whereas Bloomfield consists predominately of mudstone and siltstone.
76. The coal pit is mined through the process of blasting material above coal seams (overburden), removing that overburden with trucks and excavators and then extracting the coal. The overburden is fragmented to allow it to be effectively removed and loaded into trucks. This is done by blasting. The process of fragmenting the overburden involves drilling holes of sufficient diameter to allow for the loading of explosives in sufficient quantities to blast.
77. During the period 2008 to 2012, Mr Tony Laing was responsible for the explosives project undertaken at Rix's Creek and Mr Brendon Clements was responsible for, or involved with, the explosives project undertaken at Bloomfield. Prior to 2010, the explosives project at Bloomfield was under the guidance of Mr Luke Murray and Mr Neil McLennan.
78. The objective of the explosives projects were to determine the maximum percentage of recycled oil that could be used in each 'shot', or explosives charge, without compromising energy levels in the blast or the properties of the explosive.
79. The claimed activities involved the replacement, in the fuel component of the explosive used to blast the overburden at Rix's Creek and Bloomfield, of diesel fuel with "refined waste oil". Replacement was carried out in ratios of 10% increments, starting at 50%, and increasing over time to 100%. In the case of Rix's Creek, each replacement increment was tested in the laboratory, and then a series of trial blasts, with the early trial blasts only using the new fuel mix in a small proportion of holes, then on a large scale.
80. In the case of Bloomfield, there was no laboratory or small-scale testing; the claimed trial and testing activities commenced on the large-scale.

## Overview of Explosives Projects and Relevant Evidence

81. I have carefully read and considered the witness statements (including exhibits) of Mr Laing filed in these proceedings dated 17 November 2015, 19 February 2016 and 30 September 2016, and the witness statements (including exhibits) of Mr Clements filed in these proceedings dated 13 November 2015, 19 February 2016 and 30 September 2016. I have also carefully considered the oral evidence given by both Mr Laing and Mr Clements at hearing. Aspects of their evidence are relevantly summarised below.

### Rix's Creek

82. It is Mr Laing's evidence that he presented his proposal for the claimed explosives activities at Rix's Creek to the Board during a meeting in early 2008. He described the meeting as a "*relatively informal discussion*", but nevertheless, says that the Board approved his proposal. There are no documents recording the minutes of the Board meeting.

83. In around March 2008, a ratio of 50% refined waste oil and 50% diesel was purportedly successfully tested in the laboratory. There are no records before me detailing the results of the laboratory test.

84. Field trials commenced at Rix's Creek of the 50/50 mix in July 2008.

85. The first blast of the first trial was shot number 1387 and was conducted on about 24 July 2008. Out of 399 holes within the blast pattern, only 10 holes were loaded with a 50/50 refined waste oil and emulsion mix. The other holes were loaded with 100% diesel and emulsion.

86. Mr Laing's evidence in his witness statement dated 17 November 2015 is that he "*prepared at the time of that initial trial blast a document that sets out the details of that blast*". He says he "***did not prepare such a document for each blast. This document was for the purposes of documenting the trial***". A Shotfirer's Report listing details of the shots location, shots fired, explosive type, certain statutory information, any personnel being supervised and other comments was completed for the first blast undertaken on 24 July 2008.

87. At hearing, Mr Laing gave evidence during cross-examination that in relation to the first 50/50 trial on 24 July 2008, the result of the trial was "*my visual assessment of the shot and*

*that's what I do*". In regards to Shotfirer's Reports, Mr Laing accepted that they were a statutory requirement, and a normal report that would be completed for any blast.

88. The trial of the 50/50 refined waste oil and emulsion mix continued from July 2008 to March 2009. Mr Laing states in his witness statement dated 17 November 2015, that the trial involved increasing the number of holes using the 50/50 mix and that he *"needed several months of data to trial the 50/50 ratio in the field before moving on to the next stage of the project"* because he *"needed to feel confident with the stability of the mix and its performance across a realistic range of variables"* [Emphasis added]. Such variables included: geography, fragmentation, and weather variables, amount of blast fumes and noise and vibration.
89. A document summarising the results of the first phase of trials with a 50/50 mix was prepared by Mr Laing and is dated 18 May 2009. The applicant relies on this document is evidence that the first phase of trials was completed successfully and that Mr Laing was *"satisfied that a 50/50 mix performed well across a realistic range of different conditions"*. I fail to see how this document provides any such detail. It is bereft of any details of variables allegedly considered during the trial (see [88] above). For example the document does not contain any data collected, details of blasts undertaken, geography, moisture levels, depth of shots, effectiveness of the explosives, fragmentation of the overburden, impacts of weather variables, recordings of blast fumes and recordings of noise and vibration performance. I would expect to see this type of data given that it is Mr Laing's own evidence that these variables affected the stability of the mix and that the implied success of the trial was measured on the effectiveness and/or safety of the explosive.
90. The only variable discussed in the document dated 18 May 2009, is the productivity rate of earthmoving machines used to excavate the blasted material. Mr Laing's conclusion is that *"when comparing the dig rate of the same machine in the same blasted material there has not been any discernible change in the rates. The rates have been similar and so the use of the refined oil has not been to the detriment of the explosive energy produced in the bulk explosive products"*. The findings in regards to this variable are not substantiated by documentary evidence. The same can be said in regards to fume. Mr Laing states in the document dated 18 May 2009, that *"another issue being investigated is fume that is generated by the blast"*. He concludes that *"the use of refined oil and ANFO [Ammonium Nitrate/Fuel Oil] does appear to have a benefit on the generation of fume. There is still*

*some generated but it does appear to have a reduction in intensity*". On what basis he makes this conclusion is unclear.

91. In around July-August 2008, a ratio of 60% refined waste oil to 40% diesel was purportedly successfully tested in the laboratory. There are no records before me detailing the results of the test.
92. Field trials commenced at Rix's Creek of the 60/40 mix. The first blast was shot number 1418 and was conducted on 8 April 2009. It is Mr Laing's evidence that out of 350 holes within the blast pattern, 50 holes were loaded with the 60/40 refined waste oil mix and emulsion. Trials of the 60/40 mix continued up until October 2009 and as the trials progressed, the proportion of holes using the experimental fuel mix was increased. Mr Laing states in his witness statement dated 17 November 2015 that in October 2009 he was satisfied that a 60/40 mix performed well across a realistic range of different conditions. It is unclear how this conclusion was reached. There is no documentary evidence before me detailing the blasts conducted, including the stated range of different conditions and the impact, if any, of variables such as those discussed above at [88] (geography, moisture levels, depth of shots, effectiveness of explosives, fragmentation of the overburden and the impact of weather variables, recordings of blast fumes and recordings of noise and vibration performance).
93. This can also be said for the third phase of the trial, testing the ratio of 70% refined waste oil to 30% diesel. The laboratory testing was successful and field trials commenced at Rix's Creek on 28 October 2009. Unlike the previous two phases, the first blast pattern had 230 holes, all of which were loaded with the 70/30 refined waste oil mix. A Shotfirer's Report was created for this blast.
94. The trials of the 70/30 mix continued up until about February 2010. Mr Laing's evidence is that the trials continued because he "*felt it was important to obtain data across a range of variables that could affect the stability and performance of the mix*". In about February 2010 he was "*satisfied that the 70/30 mix performed well across a realistic range of different conditions*". Consistent with the previous phases of the trial, there is no documentary evidence before me detailing the blasts conducted after the first initial blast.

95. In his witness statement dated 17 November 2015, Mr Laing says that in February 2010, laboratory tests were successfully undertaken on a sample of refined waste oil with a ratio of 80% refined waste oil to 20% diesel. At hearing, Mr Laing was challenged in cross-examination about when the laboratory tests were undertaken on the 80/20 mix. Mr Laing conceded that in accordance with his notes, as at 18 May 2009, the laboratory had already confirmed that the 80/20 mix was ready to be trialled in the field. Field trials were not commenced however until March 2010 with the 80/20 mix.
96. The first blast was shot number 1468 and was conducted in March 2010. All holes were loaded with an 80/20 mix. Bizarrely there is no evidence before me confirming the outcome of the trial of the 80/20 mix. I assume that it was successful because the trial progressed to the next phase.
97. In March 2010 the laboratory successfully tested a sample of refined waste oil with a ratio of 100% refined waste oil. The first blast was shot number 1473 and all holes were loaded with refined waste oil. There is no document recording the details of the first blast or its outcome.
98. Field trials continued of the 100% refined waste oil ratio until October 2010. Mr Laing's evidence is that the continuation of the trial allowed for the analysis of nine separate locations in ten different seam locations. Consistent with the conduct of the alleged explosives activities undertaken thus far, there is no documentary evidence before me detailing the blasts undertaken with the 100% refined waste oil ratio.

*Solvent washed refined waste oil*

99. Mr Laing's evidence is that by October 2010, Australian Waste Oil Refineries ("**AWO**") were supplying solvent-washed refined waste oil and as such, it became necessary to recommence the trials.
100. Field trials of the 50/50, 60/40 and 70/30 mix of solvent-washed refined waste oil occurred during the period October 2010 to August 2011.
101. The first blast was conducted on 13 October 2010. A Shotfirer's Daily Report was created for the first blast.

102. Mr Laing's evidence is that a full range of ratios were tested and 100% was reached in October 2011. The trials of the 100% mix continued up until 27 March 2012. A spreadsheet containing the details of the trial performance is in evidence. The spreadsheet appears to contain data recorded from blasts conducted from 24 July 2008 to 14 March 2011.
103. At hearing Mr Laing gave evidence that he created the spreadsheet in "*probably 2013, maybe 2014 when all this process started*". When questioned about where in the document the results of the solvent-washed trials were recorded, Mr Laing said "*there's no recording. It's my personal observations and driving the project*". He accepted that there was no evaluation or assessment of the results recorded in the documents.
104. Velocity of detonation ("**VOD**") tests were undertaken on the explosive containing 100% refined waste oil. In evidence is a document containing the results of three trials undertaken on dated 27 August, 12 September and 8 October 2012.

#### Bloomfield

105. In about 2010, it was decided that a similar project to the Explosives Project undertaken at Rix's Creek, was to be carried out at Bloomfield. Mr Clements' evidence is that the differences in the geology of the Rix's Creek and Bloomfield mines impacted upon the explosives used at each site, how these explosives were used and the properties of the explosives when shot. Mr Clements felt it was necessary to undertake field trials of the refined waste oil at Bloomfield to confirm that the differences did not affect the volatility of the use of the different ratios of refined waste oil. The trials were initially conducted under the guidance of Mr McLennan and Mr Murray and in about late 2010, Mr Clements took over the running of the trials.
106. In January 2010, field trials were commenced of the refined waste oil at Bloomfield of a 50/50 mix of refined waste oil and diesel. The ratio was increased incrementally to 60/40, 70/30, 80/20, 90/10 then finally 100%.
107. The first blast of the trial of the 50/50 mix of refined waste oil and diesel was shot number 6065 and was conducted on 18 January 2010. As per statutory requirements, a Shotfirer's Daily Report was created to document this first blast.

108. At Bloomfield, a spreadsheet was kept, recording the trial blasts and the experimental refined waste oil fuel mixes used throughout the trial period. Unlike the Shotfirer's Daily Report, the spreadsheet captures the ratio of refined waste oil used in each blast.
109. The trials of the 50/50 mix continued until January 2011. Mr Clements says in his witness statement dated 13 November 2015, that the continued testing of the 50/50 mix allowed them to *"test the mix in a variety of conditions to develop sufficient comfort in the results of using the 50/50 mix at Bloomfield. The results showed that the 50/50 mix produced similar blast outcomes to that of the normal explosive mix (i.e. 100% diesel) without any material adverse side effects, such as fume"*.
110. Field trials of the 60/40 mix commenced around January 2011 with the first shot being fired on 14 January 2011. The first blast was shot number 6148.
111. The field trials of the 60/40 mix continued until 1 February 2012. As with the 50/50 mix, Mr Clements' evidence is that the results showed that the 60/40 mix produced similar blast outcomes to that of the normal explosive mix (i.e. with 100% diesel).
112. Field trials of the 70/30 mix were commenced on 1 February 2012 with the first shot conducted on 6 February 2012 (shot number 6242). A Shotfirer's Daily Report was created to record the results of this first shot.
113. VOD testing was carried out in relation to the 70/30 mix in February 2012. The results of the tests undertaken on 27 February 2012 are contained in a spreadsheet and photographs.
114. Field trials of the 70/30 mix continued up until 1 May 2012. As with previous tests the results show that *"the 70/30 mix produced similar blast outcomes to that of the normal explosive mix (100% diesel) and the 60/40 mix without any material adverse side-effects"*.
115. Field trials of the 80/20 mix commenced in May 2012, with the first shot conducted on 2 May 2012 (shot number 6258). A Shotfirer's Daily Report was created to record the results of this first shot.

116. The field trials of the 80/20 mix continued up until 31 July 2012. Again, the *“results showed that the 80/20 mix produced similar blast outcomes to that of the normal explosive mix (100% diesel) and 70/30 mix, without any material adverse side-effects”*.
117. Around 1 August 2012, field trials were commenced with the 90/10 mix. The first shot was blasted on 1 August 2012 (shot number 6288). A Shotfirer’s Daily Report was created to record the results of this first shot.
118. Trials of the 90/10 mix continued up until 31 October 2012. Once again, the *“results showed that the 90/10 mix produced similar blast outcomes to that of the normal explosive mix (100% diesel) and 80/20 mix, without any material adverse side-effects”*.
119. Field trials commenced of the 100% refined waste oil around 1 November 2012. The first blast (shot number 6325) was conducted on 5 November 2012. A Shotfirer’s Daily Report was created to record the results of this first shot.
120. Trials using the 100% mix continued until December 2012. It is Mr Clements’ evidence that continuing the trial at 100% mix allowed it to be trialled in a number of the different seams found at the Bloomfield mine.
121. Mr Clements says in his witness statement dated 13 November 2015, that *“the results of the trial showed that the use of the 100% mix did not adversely impact the blast results in each of the conditions found at the Bloomfield mine”*.

### **Expert Evidence**

122. I have read and considered the expert reports (including exhibits) of Dr Alastair Torrance dated 1 February 2016 and 30 September 2016, and the expert report (including exhibits) of Mr Alexander Mandl dated 19 August 2016. I have also carefully considered the joint report prepared on 27 October 2016 and the oral evidence given by both Dr Torrance and Mr Mandl at hearing. Aspects of their evidence are relevantly summarised below.
123. Dr Torrance and Mr Mandl are in agreement that *“the evidence in the literature does not show any indication of the use of 100% recycled oil with emulsion blends in general use in the industry”*. They agree that *“field conditions differ from those in the laboratory, particularly in relation to mixing of chemicals on the MMU and the conditions in a blast hole*

such as water, mud, geology and trace chemicals. Initial trials in the field carry a greater element of risk than those in the laboratory, with greater exposure to the consequence of failure”.

124. Dr Torrance is of the opinion that “at each stage of the process, new knowledge was gained by the performance of this product type under a range of blasting conditions”. He says in his report dated 1 February 2016:

*[31] It is important to note that the rock mass varies across a mine and from mine to mine. Consequently products that may be successful at one mine site may perform poorly at another mine, even if they are on adjacent properties. Different mining methods also put different performance requirements on explosive output. So a mine that uses only excavators and shovels will have a different energy requirement to one that uses draglines and potentially cast blasting.*

*[32] The height of the local water table and annual rainfall at a mine will also have an influence on product selection and performance. All these factors must be taken into consideration when assessing explosive performance. Therefore **testing cannot be limited to a single test with a pass/fail criteria. There must be multiple tests in all anticipated conditions before a product can be put into routine use across the mine.** [Emphasis added]*

125. Mr Mandl says in his report dated 19 August 2016:

*[6.1] There appears to have been some form of plan, but it is not visible in the form of the clearly defined and documented plan that I would expect to see given the extent and duration of the trial phase. There is a paucity of cost measurement and controls that would normally be expected to inform the project and provide a means of comparison with normal operations... The level of measurement and documentation supporting the plan is considered low, given the data that should have been available. Rather, **it seems as though there was a concept in mind and that this was enough to progress the activity.***

...

*[10.7] The observation and measurement parameters for each mine are the same, despite the claim of substantial difference in mining conditions. Were there to have been real concerns about differential performance in variable ground conditions, there are many more measurements or data points that could have been obtained... **There is no evidence of this level of investigation.** In essence, there seems to have been a point at which the need for project performance measurement and observations ceased and normal production blasting continued. This point has not been identified in the reference material supplied and it is therefore difficult to determine when the project actually concluded. [Emphasis added]*

126. In conclusion, Mr Mandl states:

*[12.1] During the preparation of this report, I have been concerned that the technical approach taken was relatively rudimentary and unsophisticated, despite the continual references in both the documentary evidence made available, literature,*

*and my own knowledge and experience, to **the need for stringent examination and assessment at each stage of the evaluation process. The observation and measurements recorded for each stage of the trials involved little, if any, more data than that which would be expected for normal blasting operations.***  
[Emphasis added]

### **Activities A2 & C2 – Design, Development and Investigation of Concept**

#### *Systematic, Investigative and Experimental*

127. The applicant contends that the claimed explosives activities were systematic because the design of the new fuel mix proceeded according to an orderly and logical plan. The design involved increasing the replacement of diesel with refined waste oil in 10% increments, with the proportion increasing over time up to 100%. The applicant further submits that their claimed explosives activities were conducted according to a clear plan where there was first laboratory testing, and then a series of trial blasts for each 10% increment.
128. In his three statements before the Tribunal, Mr Laing does not give any evidence of any documented plan for the explosives project at Rix's Creek, other than his evidence of a proposal which he made to the Board in early 2008.
129. At hearing, Mr Laing accepted in cross-examination that at the time of the Board meeting, there was no "*documented*" plan of the proposal that he put to the Board; there was no worked out plan or method for trial and testing; there was no plan for thorough enquiry of the subject matter of mixes of diesel and refined waste oil; there was no detailed plan prior to trialling that identified technical risks and possible adverse effects of replacing diesel with refined recycled oil; there was no identification of possible measures to mitigate those possible adverse effects; and there was no project budget.
130. In re-examination, Mr Laing was alerted to, and subsequently recalled a "*handwritten document that [he] came up with ... that outlined where [he] was going to progress to*" which he said was prepared in 2008 after the Board meeting. He said that he had "*simply forgotten about this one*" but that the document was in consequence of the oral approval of his proposal at the Board meeting. As identified by the respondent in closing submissions, the plan contained in the document contradicts Mr Laing's account of the proposal approved by the Board. Namely that he told the Board that the replacement ratios would potentially go up to 100%, whereas the handwritten plan suggests going up to 80%.

131. In relation to a plan for the activities and the recording of a hypothesis, the applicants rely on the R&D Project Plans. As already stated, I do not place much weight on the R&D Project Plans.
132. In regards to the explosives projects at Bloomfield, Mr Clements said at hearing that *“there was a plan but it wasn’t necessarily written down”*. He said, *“I don’t believe there were many documents because at the start I don’t believe we knew how far the project was going to go”*, and he saw preparing a budget as a *“pointless task”* for *“something that we really didn’t know if it was going to work”*.
133. At hearing, Mr Mandl and Dr Torrance seemed to agree that the incremental approach adopted by the applicants was not preferable to any specifically quantified risk. Mr Mandl opined that *“quantifying the risk [of failure]...before we even start...would actually be part of a scientific method”*.
134. The experts agreed that there was a paucity of documentation.
135. An important example of this was in relation to the recording of “fume events” which are submitted by the applicants to be among the key risks necessitating the extensive and incremental testing of the different fuel substitutions. Mr Mandl said that he would have expected to see in the shot reports *“a constant notation of the degree of fume...it was [recorded] very sporadically... which seemed...at odds to the level of importance that had been stated in other areas”*. Dr Torrance added that he had *“seen a lot better”* levels of reporting.
136. Another important example is the lack of any stated or specified end point of the trials, in the sense of criteria for success or failure. At hearing, Mr Mandl found this *“curious”* and said:  
  
*...a trial is supposed to have an outcome which then informs you to progress on to the standard production. There wasn’t even anecdotally any stated outcome from the trials other than it worked...Part of this involves a whole lot of assumptions and they’re not informed by data that has been converted to information.*
137. The evidence does not establish that the design, development and investigation of the concept was systematic, investigative and experimental. There was evidently some kind of initial plan; however the scarcity of the documentation during the conduct of the trial as a whole bespeaks a lack of a systematic, investigative and experimental approach.

138. There is not enough evidence before me to find that there was a systematic progression of work from hypothesis to experiment, observation and evaluation, followed by logical conclusions.
139. While the trial may have progressed in increments, namely 10% increments, it cannot be said that the trial was conducted according to a well thought out plan. For example, there is no evidence before me detailing what conditions were trialled for each 10% increment, what variables were present and considered, how many blasts were conducted for each phase and how many holes were used per blast.
140. Mr Lang and Mr Clements appear to be satisfied with the results of the study, in that it progressed through the stages, however there is very limited, if any, evidence before me detailing the analysis of data collected in support of their conclusions. In my mind this is essential. The Explosives Projects were meant to be trialling different ratios of refined waste oil and diesel to test a stated hypothesis. To determine whether or not the trials were successful, there would logically be some analysis of the results in accordance with the stated aim or objective at each stage; particularly in regards to technical risk or progression.
141. Mr Laing's evidence is that certain variables were relevant in determining the stability of the mix. I cannot say whether these variables were investigated during the trial; namely geography, moisture levels, depth of shots, effectiveness of explosives, fragmentation of the overburden and the impact of weather variables, blast fumes and noise and vibration performance. In regards to Rix's Creek, other than a few records of the first shot of each 10% increment, there is very limited documentary evidence before me detailing the actual blasts conducted.
142. While documentary evidence is not a statutory requirement, it is logical that documentary evidence would assist in establishing whether or not the activities were conducted in a systematic, investigative and experimental manner. Without such evidence it is impossible, other than by making assumptions, to make any findings on the way in which the trials were conducted and how the results were analysed. Accordingly, I am not persuaded that the Explosives Projects were conducted in a systematic, investigative and experimental fashion.

*Involving Innovation or High Levels of Technical Risk*

143. It is accepted between the parties that as at 2008, the replacement of diesel with refined waste oil up to a 50% proportion was not novel. The applicant contends that the replacement above 50% involved innovation. Dr Torrance's evidence is that the total replacement of diesel in explosives at ratios above 50% was "*unheard of*" in Australia.
144. As already stated, the experts agree that the literature does not show any indication of the use of 100% recycled waste oil with emulsion blends in general use in the industry. The question however is whether a fairly large constituent part of the activity involved novelty. In words consistent with the Act, did it involve an "*appreciable element of novelty*?"
145. At hearing, Mr Mandl opined that there was "*no appreciable novelty in the process of replacing the diesel with refined waste oil*". He was of the firm opinion that:
- ...the success of that process with a reasonable amount of investigation beforehand could have reasonably been predicted and that there had been sufficient use of other fuels heading up to that level that indicated that going from one level to another wasn't particularly novel. It is, at the end of the day, replacing a fuel with a fuel.*
146. Dr Torrance agreed that the concept of replacing one fuel with another was not "*effectively novel*" and "*happened all the time*", however opined that to "*fully understand the chemical constituents and the variability in terms of how it impacts on the emulsion has an element of novelty about it*".
147. This is not a "*fairly large constituent part*" of the claimed design, development and investigation activities, rather a relatively minor incident of the particular replacement program carried out.
148. For all the above reasons, I am not satisfied that there was an appreciable element of novelty in relation to the claimed activities.
149. The applicant contends that the claimed activities involved high levels of technical risk. The risks included the emulsion being impacted on the explosive breakdown, resulting in potential product degradation, explosive misfire, over or under-fragmentation of the rock, odour and/or fume events. The applicants also contend that the levels of technical risk were high on the basis that a previous attempt of replacement of diesel with biodiesel had

failed, even though biodiesel had known properties; Orica, the explosives supplier, required significant testing; and regulations in Canada do not permit the use of more than 50% refined waste oil.

150. In *RACV*, in regards to technical risk, the Tribunal said at [217]:

*... If activities involve high levels of technical risk, there **must** be a significantly greater chance or possibility that the technical processes or means involved in the activities will fail than would normally be the case. What would normally be the case will be ascertained by reference to the industry or field of endeavour in which the activities are being conducted. It will be a matter of evidence. [Emphasis added]*

151. I am not convinced that the evidence before me supports a finding that the particular substitution proposed by the applicants was attended by a “*significantly greater chance or possibility of failure*” than any of the fuel that might be used. If anything, the evidence shows that the risk associated with fuel replacement is well-known and can be managed by relatively simple analysis and testing. I have summarised some of the relevant evidence as follows.

152. Mr Mandl says in his expert report dated 19 August 2016 at [2], that “*waste oil*” is a contaminated product that is unsuitable for its original purpose. “*Refined waste oil*” is waste oil that has been returned to original specification by refining, which involves processes including filtering and distillation. He says that this is to be distinguished from, say, “*filtered waste oil*”, which is waste oil that has not been distilled, but has only had removed “*by relatively simple means such as reaction and settling, and screen filtering*” solids, inorganic materials and some additives, such as water. Mr Mandl states that refined waste oil, unlike raw and filtered waste oil, “*has characteristics which are known to a high degree of certainty*”.

153. Further, in his report Mr Mandl says (at [3.2(f)]-[3.2(g)]) that refined waste oil has “*known components and characteristics*” and “*can be subject to relatively simple specification testing with a relatively high degree of assurance*”. He further opined that significant risk will only arise “*if there was no work done on analysing the contents of the fuel before use*”.

154. At hearing, Mr Mandl gave evidence that “*contaminants are going to manifest themselves most likely in a chemical reaction,...or in an effect on the surface chemistry of the emulsion more likely at the laboratory stage... rather than at the field stage*”. He also opines that in

relation to adding the substituted fuel mixes to ANFO, he would be “*almost certain that it would perform before a field trial*”. In regard to the emulsion mixture, he opined that he “*would be reasonably confident that it would perform as expected*” but could not be 100% certain.

155. Dr Torrance did not opine as to the level of technical risk, but said that the presence of contaminants is “*something that need[s] to be explored in some detail to have comfort that...any of those trace chemicals that are in there are not going to impact on the emulsion’s stability*”. However, he conceded that with the appropriate set of tests, refined waste oil is capable of being reliably characterised to a high degree of certainty; with a potential for batch variability.

*Carried on for the purpose of acquiring new knowledge or creating new or improved materials, products, devices, processes or services*

156. Senior counsel for the respondent put to Mr Laing in cross examination that replacement of fuel oil was an incremental improvement upon the known 50/50 mix, and that it did not have the purpose of creating a new product. This proposition was denied. However when it was put to Mr Laing there was no document at all of any plan or purpose of creating a new product, Mr Laing said “*we were changing our percentage of the mix, not creating a new product*”.
157. This evidence is significant in that Mr Laing, the person responsible for the conduct of the Explosives Projects at Rix’s Creek, understood the activities being undertaken were not for the purpose of developing a new product.
158. Accordingly, I find that the claimed activities lacked the requisite purpose under s73B(1) of the ITAA.

**Laboratory Testing (Rix’s Creek only) (Activity A2 or A3)**

159. For reasons already detailed above, I find that the laboratory testing did not involve high levels of technical risk or novelty.
160. Further, the evidence shows that the explosives manufacturer, Orica, was conducting laboratory testing and notifying Mr Laing of the results by telephone. Dr Torrance said at

hearing that effectively Orica was “*doing that risk assessment themselves when they were doing a series of laboratory tests and giving approval for the next stage to be carried out, using that oil with their products*”.

**Small Scale Testing (Rix’s Creek only) (Activity A2 or A3)**

161. This activity is described in the witness statements of Mr Laing. For all the reasons already set out above, I am not satisfied that this testing involved high levels of technical risk or novelty and was systematic, investigative and experimental. Nor do I find that it had the requisite purpose.

**Large Scale Testing (Activities A3 and C3)**

162. The applicants contend the trial blasting activities on the mine sites were carried out for a purpose *directly related* to the carrying out of the claimed core activity of design, development and investigation of experimental fuel mix.
163. In any event, since the core activity claim fails, is not necessary for me to determine this question.

**EXCAVATOR PROJECTS – ACTIVITIES B1 TO B5 (RIX’S CREEK & BLOOMFIELD)**

164. There were three different excavator projects: two at Rix’s Creek (EX 3600 and EX 5500) and one at Bloomfield (EX 5500). The Rix’s Creek EX 5500 project commenced in the 2010-2011 year, and the other two projects started in the 2008-2009 year.
165. The main part of the projects was the design of new excavator buckets, being either commercially available buckets (but not the ones recommended for the relevant excavator) or custom-built buckets. For the EX 3600 project at Rix’s Creek, six different buckets were designed and tested; for the EX 5500 project at Rix’s Creek, three buckets were designed and tested; for the EX 5500 project at Bloomfield, five buckets were designed and tested but none transpired to be particularly successful.
166. The projects involved several trials which included, among others, reviewing bucket payload data produced from VIMS, physical observations in time and motion studies, and

developing design changes to the buckets to reduce the number of passes on increasing overall productivity.

### **Overview of Excavator Projects**

167. I have carefully read and considered the witness statements (including exhibits) of Mr Clements filed in these proceedings dated 13 November 2015, 19 February 2016 and 30 September 2016, and the witness statements (including exhibits) of Mr Christopher Moy filed in these proceedings dated 20 November 2015, 19 February 2016 and 29 September 2016. I have also carefully considered the oral evidence given by both Mr Clements and Mr Moy at hearing. Some of which is relevantly summarised below.

#### Excavator EX 3600 – Rix’s Creek

168. At Rix’s Creek the EX 3600 Excavator Project was undertaken between April 2008 and March 2012.
169. The Excavator Project involved six trials, modifying the configurations of the EX 3600 bucket by testing (i) the effect of the addition of two ‘hungry boards’, (ii) changing the bucket heel shape, (iii) changing the pin distance so as to influence leverage and (iv) experimenting with different bucket widths to increase breakout force.

#### Excavator EX 5500 – Rix’s Creek

170. This project involved a review of the interaction between the EX 5500 excavator at the Rix’s Creek site and the Caterpillar 793 trucks when removing overburden and coal and the development of more efficient and effective methods and devices to improve the productivity of the equipment. The project involved trialling several bucket designs and monitoring the results of loading overburden and coal into these trucks so as to improve the payload on the excavator in the conditions found at the Rix’s Creek site.
171. The applicant conducted three trials at the Rix’s Creek site. Design changes in each trial resulted in modifications and testing of a bucket lip and subsequently custom fitting a bucket lip to a larger bucket that was beyond the manufacturer’s recommendations.

### Excavator EX 5500 – Bloomfield

172. The EX 5500 Excavator Project at Bloomfield was undertaken between April 2008 and March 2011. The project involved modifications to the design of the Hitachi EX 5500 excavator and the use of different trucks to determine whether it was possible to achieve greater efficiencies in load passes. The Bloomfield identified that it could achieve an overall increase in productivity by developing a new bucket design. The proposed bucket design required a trial and testing of several designs of the EX 5500 excavator. The goal of the project was to develop design modifications which were capable of generating a better pass match for the excavator and 793 trucks, thereby reducing 'cycle time'.
173. The project had two components; (i) matching the fleet trucks with the EX 5500 excavator to maximise efficiency and reduce cycle times below what was recommended by Hitachi, and (ii) developing suitable modifications to the EX 5500 bucket to meet that end.
174. The apparent aim in relation to the 'hungry board' design was to collect material that would otherwise overflow during loading. In regards to the design of the bucket, the applicant hypothesised that making modifications to the lip of the bucket, by varying the teeth and pin spacing, could increase ground penetration. The applicant contends that these modifications pushed the capacity of the bucket and excavator to beyond its intended design limits and went beyond the manufacturer's recommendations.

### **CONSIDERATION**

175. I have carefully read and considered the expert reports of Mr Fitzsimmons filed in these proceedings dated 11 February 2016 and 30 September 2016, and the expert report of Dr Brian White filed in these proceedings dated August 2016. I have also carefully considered their joint expert report dated 26 October 2016 and the oral evidence given by both Mr Fitzsimmons and Dr White at hearing.
176. In relation to the core activities, Dr White and Mr Fitzsimmons agree on a number of matters, however disagree on whether the activities were systematic, investigative and experimental; whether the activities involved innovation; and whether they were carried on for the purpose of acquiring new knowledge or creating new or improved devices.

*Systematic, Investigative and Experimental*

177. The respondent contends that the absence of documentation, namely any plan for the investigation, hypothesis, results of the investigation or analysis and evaluation of the results, demonstrates that the activities were not carried out in a systematic, investigative and experimental manner. The respondent further contends that the ‘one variable at a time’ (OVAT) method adopted was inappropriate in the circumstances and deprives the activities of any systematic, investigative and experimental character that they might otherwise have had.
178. In relation to a plan for the activities and the recording of a hypothesis, the applicants rely on the R&D Project Plans. As already stated, I do not place much weight on the R&D Project Plans. Mr Moy gave evidence to the effect that he did not know whether the R&D Project Plans were prepared before or after the projects commenced. This reinforces that the plans did not actually guide the conduct of the projects.
179. Mr Clements’ evidence was that it was not known how many steps there would be in the supposed tests and that he did not see any point in laying out the steps and preparing a timetable. He conceded at hearing that the project “*didn’t set a numerical value as a target*”, and therefore did not have “*a clearly defined finish line*”.
180. The test in s73B of the ITAA does not dictate that the method used to conduct claimed activities must be the optimum method. However, it is logical that for the claimed activities to be systematic, investigative and experimental in the requisite sense, the design must to be appropriate to the circumstances. In other words, what is done must be carried out in accordance with a system or plan or organised method, followed by logical conclusions. This is the very nature of an investigative and experimental activity. Having regard to the experimental design assists in determining whether the claimed activities were undertaken to test a specified hypothesis and in determining whether the work carried on was for the purpose of acquiring new knowledge or developing an improved product.
181. In the Excavator Projects there were a considerable number of factors or variables impacting upon the efficiency or productivity of the buckets being designed and redesigned. Mr Clements identifies 13 variables in his witness statement dated 13 November 2015 (at [92]) and accepts that there are a “*number of different variables that should...be taken into*

*account, tested and considered*". It is Mr Fitzsimmons' evidence that "*whenever any of these factors changes, the overall productivity of the excavator/bucket combination is likely to change*".

182. The method adopted involved changing one variable at a time and recording the apparent effects of that change, also known as the OVAT method. In this approach, all but one of the variables or factors are held constant and then that one selected variable is progressively changed and the effects recorded. All the other relevant variables, including the 13 variables identified by Mr Clements as ones that should be taken into account, tested and/or considered, were not accounted for. The problem with this method in the circumstances is that those conducting the activities cannot be satisfied that the apparent effects in the results are not simply natural variation experimental error and the results cannot be reliably attributed to the single variable being changed. This is because interaction effects between the several variables have not been accounted for.
183. At hearing Mr Clements confirmed that he did not test all of the variables, but said that he did consider variables such as operator effects and the "*blockiness*" of the material. He advised that the variables were observed and "*talked about*" and that he did have reports and databases covering the records of where these variables were considered and evaluated; the records however were not included in his statement.
184. Mr Clements pointed to a Palaris Report dated June 2001 as evidence of the recording of the results, and the analysis. It is Mr Clements' evidence that he was involved in the engagement, providing Palaris information to complete the Report and reviewing the Report to ensure it accurately recorded the project. During cross-examination he displayed a lack of understanding of what the results demonstrated and was unable to say whether the results, said to be recorded in the document, were statistically significant; or whether the results were attributable to natural variation. I am not convinced that this document evidences the recording and analysis of the results of the trials in any systematic, investigative, experimental sense, followed by logical conclusions. It is plain that Mr Clements cannot reliably attribute the results to the variables being changed.
185. Mr Fitzsimmons identified in his report dated 30 September 2016 (at [11]-[12]), a number of directly-controllable variables and said that "*these variables were tested using a methodology where one variable was changed at a time, which is a simple way of*

*evaluating the discrete impact of changes to a specific variable by holding other controllable variables constant*". He referred to the methodology "simply as 'one variable at a time' or OVAT". At the hearing, Mr Fitzsimmons clarified that the OVAT method would be appropriate "as a theory where nothing else is exchanging [sic] [recte: changing], there are no uncontrollable variables", "not OVAT in the context of what we're doing here".

186. Dr White in his report dated August 2016, states at [5.19] that the "OVAT approach can identify the major factors but not how their behaviour influences or is influenced by other interacting factors." In his view, "the trials conducted at Bloomfield and Rix's Creek did not even fill the basic requirements of the simple modelling approach in that there is no evidence presented to indicate that a comprehensive program was established from the outset to test all of the postulated influencing variables (factors)... Even a simple modelling approach necessitates the identification upfront of all variables (factors) that the testing programme addresses in order to ensure that they are all covered systematically, including replication and preferably randomly". He opined that "the preferable procedure, particularly where there are uncontrolled factors (variables), is to adopt a Factorial Experimental design approach".

187. An approach that is incapable of producing meaningful results, and which in fact produces results that cannot be said to be meaningful, is not a systematic, investigative or experimental activity. Dr White states in his expert report dated August 2016, that "the outcome of adopting this OVAT approach was inevitably to fail to establish the true relationships of the various affecting factors (variables)".

188. Furthermore, to the extent that there was a thorough detailed enquiry, it appears that the work carried out was only within the aspects specific to the buckets and excavators. Dr White states that:

*...although there is reference in the documentation provided to the influence of the other elements of the trucking cycle on overall productivity, there is no evidence of this being taken into account in the analyses... The analysis of the results appears to have been very basic, relying predominantly on overall machine productivity, which would have been influenced by a number of uncontrolled and interacting variables.*

189. Mr Moy says in his reply statement dated 29 September 2016 at [11], modelling all parameters was unnecessary because "we had the benefit of being on the site and being able to directly observe the excavator performance and the variations in site conditions,

*and apply our knowledge of the site*". This evidence merely confirms the non-systematic, non-investigative and non-experimental character of the claimed activities. It is not clear how the observations could possibly attribute a change in performance to a specific variable.

190. Mr Fitzsimmons says in his reply report dated 30 September 2016, that from the material provided to him, his understanding of the way the trials accounted for the uncontrollable variables was effectively to "*average them out by testing each modification across a range of conditions for each of the variables*". He further states that "*by including variation in these variables, the overall results represent them as their average*". While this might be a convenient explanation of how the uncontrollable variables were accounted for, it lacks any clarity as to how the method actually ensured that uncontrollable variables were in fact averaged out, or averaged out to a certain extent with known limitations. In Dr White's opinion, this was "*not an appropriate way to go.*"
191. At hearing, Mr Fitzsimmons accepted that averaging out could only be correct if it **uniformly sampled all uncontrollable variables uniformly or in proportion to their relative occurrence.**
192. It became clear in the course of the hearing that Mr Fitzsimmons' expert evidence was dependent on the assertions of Mr Clements and Mr Moy that each trial took place over a "*period that was long enough that they were confident they were looking at a representative sample*". Mr Fitzsimmons confirmed a number of times that he took the reports at "*face value*" because he didn't have access to all the data to do his own analysis. In light of what I have already said above in regards to the way the trial was conducted and the various uncontrollable variables, I am not satisfied that the trials were conducted over a representative sample.
193. For the reasons outlined above, I am not satisfied that the method used in conducting the Excavator Projects was appropriate in the circumstances and as such, the claimed activities were incapable of producing meaningful or logical results consistent with the stated hypothesis.
194. The claimed activities were not conducted in a systematic, experimental or investigative manner.

*Involving Innovation or High Levels of Technical Risk*

195. The changes to the bucket heel shape, bucket width, pin distance, and bucket lip were not appreciably new. The test for novelty is not whether the precise product is not identical to an existing product. What is required is qualitative newness in a “*fairly large constituent part*” of the activity.

196. In his report dated August 2016, Dr White opined at [5.16]:

*...the only element of novelty was the use of “hungry boards” on the buckets. For many years, in my experience, this technology has been widely adopted for increasing the capacity of haul trucks but I am not aware of its application on loader buckets prior to this work. I would not consider this to represent “appreciable” novelty as it merely represents an extension of the technology to a different form of container of broken materials. The other changes that were carried out, such as width of bucket, use of ground engaging tools (bucket teeth and wear resistant bucket lips) and changes to bucket geometry are, in my view, the sort of changes that would be trialled by an investigator into this ‘problem’ and lacked appreciable novelty. Such changes appear to me to be merely logical extensions of the thinking adopted when designing such buckets. [Emphasis added]*

197. It is agreed between the experts, and I accept, that the Excavator Projects involved high levels of technical risk.

*Carried on for the purpose of acquiring new knowledge or creating new or improved materials, products, devices, processes or services*

198. The alleged purpose of the Excavator Projects was to acquire new knowledge about “*how different excavator truck modifications affect and influence excavator payload and productivity in certain site conditions*”.

199. At hearing, Mr Clements stated that “*all we were trying to do was to gain productivity gains from using 793s and modifying the buckets to make that work*”.

200. It was accepted by Mr Clements that whether the buckets developed in the course of the trial would achieve productivity improvements on any other site would depend on site-specific conditions. He maintained that a bucket designed in the projects at Bloomfield and Rix’s Creek might achieve productivity gains elsewhere because “*it’s a big world out there. There could be a site that has similar problems to us in similar conditions and it might work there*”. He accepted that the activities involved customising the commercial buckets for use in the particular conditions prevailing at each mine at the time of the projects. Mr Moy also

accepted that any productivity gains derived from the customised buckets would be dependent on the site.

201. According to s73B(1)(a)(i) of the ITAA, the definition of research and development activities states that the “*new knowledge*” sought to be obtained need not have any “*specific practical application*”. There is no requirement for the new knowledge to have widespread application, and relevant to this matter, application in different sites in the industry.
202. As already stated above, I am not satisfied that the method used in conducting the Excavator Projects was appropriate in the circumstances and as such, the claimed activities were incapable of producing meaningful or logical results consistent with the stated hypothesis. Accordingly, I am not convinced that the claimed activities were carried on for the purpose of acquiring new knowledge or creating new or improved materials, products, devices, processes or services.

#### **Trial, Testing and Analysis - Directly Related**

203. The applicants submit that the trial, testing and analysis activities were “*necessary*” to assess modifications to the buckets over the course of the trials. Since the core activity claim fails, is not necessary for me to determine this question.

#### **DECISION**

204. For all of the reasons set out above, I affirm the decisions under review.

#### **DISCLOSURE OF PARTIES AND EVIDENCE**

205. At the conclusion of the hearing in this matter, Senior counsel for the applicants requested that in the publication of these reasons, to the extent that is necessary for the Tribunal to identify one or more of the two mine sites and the four lay witnesses by name, those names be replaced by pseudonyms pursuant to s35(2) of the *Administrative Appeals Tribunal Act 1975* (Cth) (“**AAT Act**”). The application was opposed by the respondent and the parties subsequently provided brief written submissions.
206. On 18 August 2015, the Tribunal made orders, including as relevant Order 1:

*In accordance with section 35(2) of the Administrative Appeals Tribunal Act 1975 (Cth), the publication of the names of the applicants in relation to these proceedings is prohibited; the names of the applicants are to be replaced by the following pseudonyms:*

*(a) in application 2015/2095, SVDW;*

*(b) in application 2015/2098, YMWK*

207. The applicant contends that the order made on 18 August 2015 would be ineffective if the names of the two mine sites were not replaced by pseudonyms in the published reasons for decision given that the names of the mine sites coincide with the applicant's names. The applicant further submits that the publication of the mine site names would indirectly reveal the applicant's names, the very thing prohibited by Order 1. Similarly, if the names of the four lay witnesses were published, this would reveal the identity of the applicants to readers of the decision who are familiar with the industry.
208. The respondent contends that because the order was made on 18 August 2015, it was made under s35(2) of the AAT Act as it has stood since 1 July 2015. Section 35(2) of the AAT Act deals with the making of orders for hearings to be heard in private.
209. Even though the terms of the order appear to correspond with s35(2) of the AAT Act as it stood before amendments effective 1 July 2015; the corresponding provision of the current AAT Act is s35(3); I do not believe that the intention was to make a non-publication order that applies to the published reasons for decision.
210. The background to the Tribunal's order stemmed from a request by the applicants, made on 3 August 2015, to be assigned a pseudonym. It was not a request for a broader non-publication order.
211. The fact that the hearing of this matter was conducted in private pursuant to s30E(4) of the IRD Act (the provision in force during the income years under review by the Tribunal, being s39T(4)), and that pseudonyms were allocated to the applicant companies leading up to and during the proceedings does not preclude the disclosure of identifying information published in the reasons for decision.
212. In considering whether to make a non-disclosure/non-publication order, s35(5) of the AAT Act provides:

*...the Tribunal is to take as the basis of its consideration the principle that it is desirable:*

- (a) that hearings of proceedings before the Tribunal should be held in public; and*
- (b) that evidence given before the Tribunal and the contents of documents received in evidence by the tribunal should be made available to the public and to all the parties*

*...*

*However (and without being required to seek the views of the parties), the Tribunal is to pay due regard to any reasons in favour of giving such a direction, including, the purposes of subsection (3) or (4), the confidential nature (if applicable) of the information.*

- 213. No cogent reasons for any non-publication or non-disclosure order have been asserted by the applicants.
- 214. I agree with the respondent that the details sought to be made confidential, being the names of the applicants, the names of the two mine sites and the names of the four lay witnesses, do not include any confidential or sensitive information and, in those circumstances, there is no justification for retaining confidentiality of such details.
- 215. The application is refused. For the avoidance of doubt, I vacate the Order made pursuant to s35(2) of the AAT Act on 18 August 2015.

*I certify that the preceding 215 (two hundred and fifteen) paragraphs are a true copy of the reasons for the decision herein of Senior Member A Poljak*

.....[sgd].....

Associate

Dated: 10 May 2017

Date(s) of hearing: **31 October, 1-3 & 17 November 2016**

Date final submissions received: **28 November 2016**

Counsel for the Applicant: **Mr M Richmond SC & Ms C Burnett**

Solicitors for the Applicant: **KPMG Law**

Counsel for the Respondent: **Ms S Pritchard SC & Mr B Lim**

Solicitors for the Respondent: **Clayton Utz**